SEPT. 22, 1960

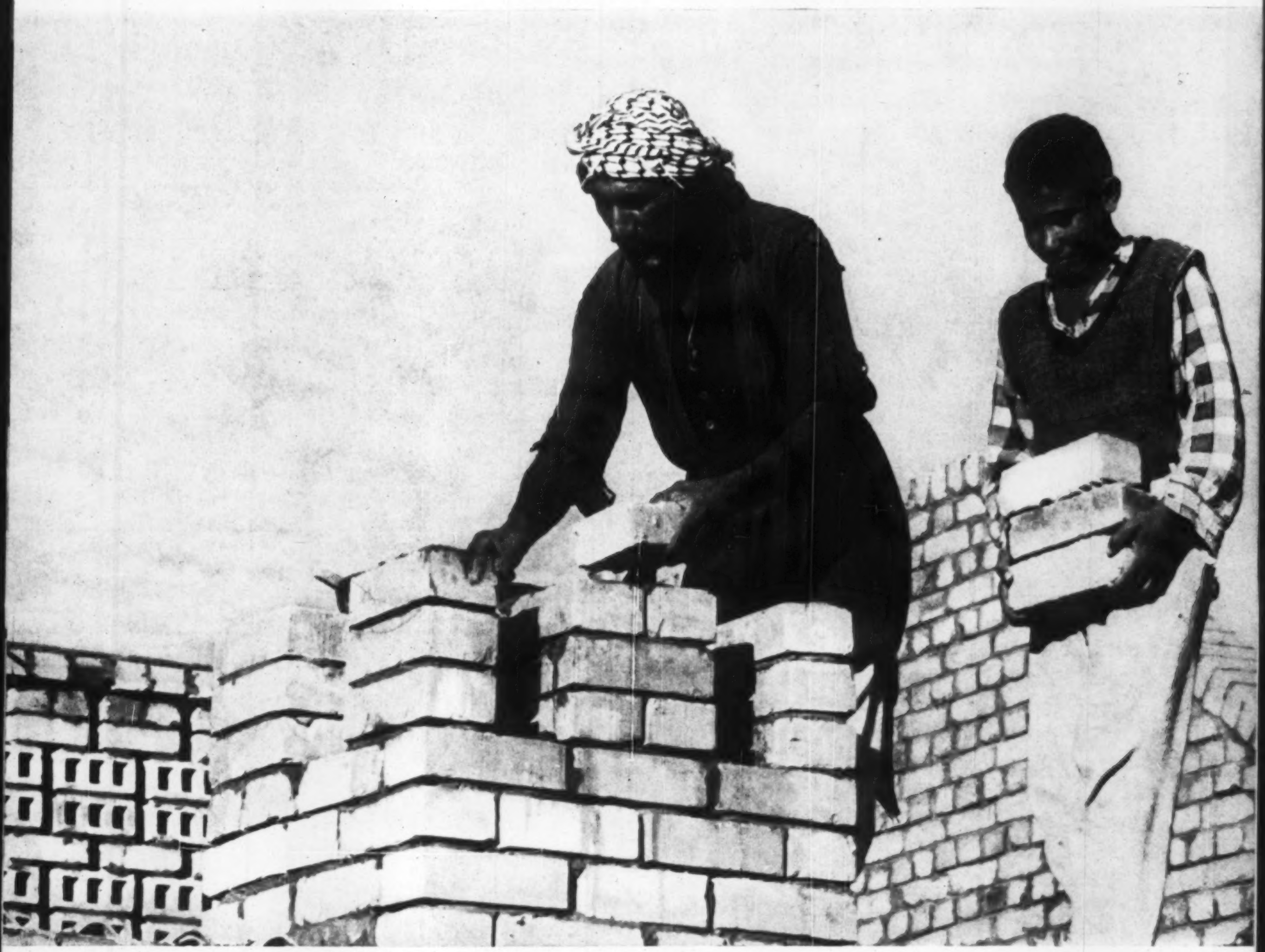
ENGINEERING NEWS-RECORD

3rd Quarterly Cost Roundup

PRICE 50 CENTS

CONTENTS ON PAGE 39

▶ **WAGE RATES: THE OUTLOOK FOR '61** *p. 55*



Labor costs around the world *p. 72*

A McGRAW-HILL PUBLICATION

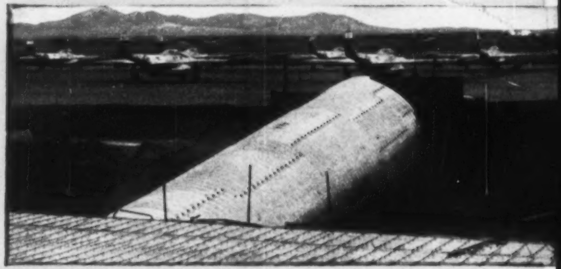
New steels are
born at
Armco

Engineers find Armco MULTI-PLATE Pipe solves unusual problems, too

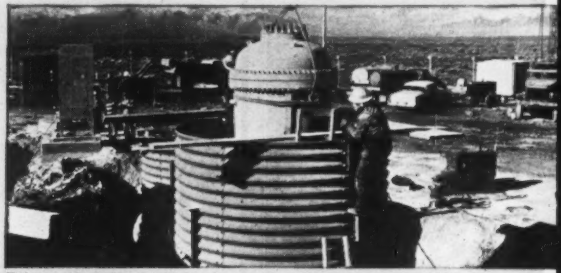
For many years, Armco MULTI-PLATE® Pipe has proved ideal as a drainage structure for highways, railroads, industries and municipalities. But frequently, engineers find these structures offer important design, strength or cost-saving advantages in *unusual* applications, too. Photographs on this page show some of these uses. May we help you determine whether MULTI-PLATE would solve *your* unusual problem?

Galvanized MULTI-PLATE Pipe is supplied in a wide range of diameters and gages. Assembly is by bolting together curved, corrugated metal plates. For engineering and dimensional data, write for catalog. Armco Drainage & Metal Products, Inc., 5480 Curtis Street, Middletown, Ohio.

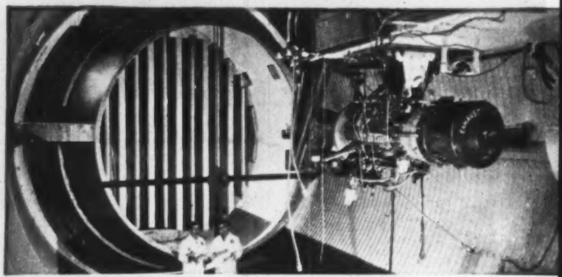
High on a mountainside, this MULTI-PLATE Pipe collects rainwater for a remote military installation.



Shown here during construction, MULTI-PLATE Pipe will be used as an exit ramp for SAC flight personnel.



This vertical Armco MULTI-PLATE Pipe is used by the AEC as a gallery for an atomic reactor.



Interior view of a large MULTI-PLATE Pipe being used as a cell for the testing of turboprop engines.

ARMCO DRAINAGE & METAL PRODUCTS

ARMCO

Subsidiary of ARMCO STEEL CORPORATION

OTHER SUBSIDIARIES AND DIVISIONS: Armco Division • Sheffield Division • The National Supply Company • The Armco International Corporation • Union Wire Rope Corporation

ALLIS-CHALMERS
45

TRY THESE KICK-FREE TOGGLE-TYPE CONTROLS

Now you can have accurate grading and day-long comfort even on your toughest jobs.

Toggle-type controls will convince you that Allis-Chalmers motor graders are built to benefit *you* . . . the best way possible. They're available only on the 127-hp *45* and 80-hp *145*.

You see, Allis-Chalmers' exclusive toggle controls tackle every job from production grading to blue-topping without the interference of wrist-snapping kickback. Easy-handling toggles permit precise blade control . . . result in the smoothest, most finely dressed grading job you've ever seen.

So try the toggle-test yourself. It's simple . . . convincing. Take hold of one of the *45's* or *145's* "kick-free" toggles and experience *precision* blade control without that typical *palm-of-the-hand* punishment.

Toggle-type control is only one reason you'll choose Allis-Chalmers motor graders. The *flat, spacious deck, comfortable foam-padded seat, extra-high throat and circle clearance* are all solid examples of your exclusive Allis-Chalmers motor grader performance features. *Allis-Chalmers, Construction Machinery Division, Milwaukee 1, Wisconsin.*

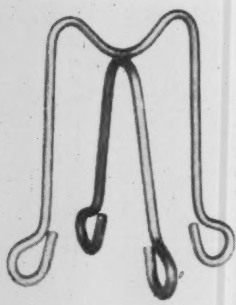
45 Motor Grader
127-hp
23,800 lbs approx.

move ahead with ALLIS-CHALMERS
. . . power for a growing world

CIRCLE 1 ON READER SERVICE CARD

Only Richmond Individual High Chairs give you all this!

- Full semi-circle for better cradling of support bars.
- Designed for strong, straight line support.
- Can be used as fixed screed chair.
- Completely galvanized—no exposed edges.
- Ends curved in to prevent tearing or snagging.
- Minimum, single points of contact. No rust staining.

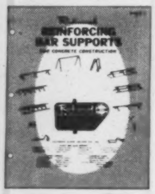


(Up to 6″ in stock over 6″ on request)

Like this Individual High Chair, Richmond has a full line of dependable, laboratory-tested, reinforcing bar supports for slab and beam work in concrete building form work.

They have all been designed to provide maximum strength with a minimum effort in handling. By asking for, and insisting on these Richmond products you will save time and money and be assured of a better job.

For full information about the complete line of Richmond Reinforcing Bar Supports send for Bulletin No. 7–and if you have a specific concreting problem, ask us about it. Write to:



Richmond
SCREW ANCHOR CO., INC.
INSIST ON RICHMOND
AND BE SURE IT'S RICHMOND

Main Office: 816-838 LIBERTY AVE., BROOKLYN 8, N. Y. Plants & Sales Offices: Atlanta, Georgia • Ft. Worth, Texas • St. Joseph, Missouri • **In Canada:** ACROW-RICHMOND LTD., Orangeville, Ontario.

EIGHTY-SIXTH YEAR OF PUBLICATION

ENGINEERING NEWS-RECORD

ABP ABC MEMBER

Editorial Offices, 330 W. 42nd St., New York 36, N. Y.
New York- LOngacre 4-3000; Chicago - MOhawk 4-5800; San Francisco - DOuglas 2-4600
Washington - REpublic 7-6630

Editor, Waldo G. Bowman

Managing Editor, **Arthur J. Fox, Jr.**

Senior Editors, **Frederick S. Merritt, James B. Sullivan**

Transportation—Roads, Railways, Airports, Pipelines, Ports
Leo J. Ritter, Jr., Edward M. Young, Jr., Joseph F. Wilkinson

Buildings—Commercial, Industrial, Housing; Codes, Specifications
Frederick S. Merritt, David B. Hill, Marianne Friedland, C. W. Griffin, Jr.

Water—Sanitation, Water Supply, River Control, Power, Irrigation
James B. Sullivan, William W. Jacobus, Jr., Marie Zanfardino

Business—Management, Labor, Finance, Markets, Contracts, Economics
Robert J. Stinson, Charles J. Harding

Regional Editors
J. Roland Carr, *Chicago, 520 N. Michigan Ave.*
Martha Alexander, *Staff Assistant*
Lauress L. Wise, *San Francisco, 68 Post St.*
Anne Garcia, *Staff Assistant*

Copy—Production
Irwin Landau, Nancy Parkes, John C. Greenough, Robert M. Echols

Presentation
Harry W. Jensen, Robert G. Young

Correspondents, Bureaus
Leah Shanks

Statistics, Prices, Costs—Business News
Elsie Eaves, *Manager*
Julia Mahoney, *Construction Reports*
Mildred Wetzel, Marian Sciorra, Marie Moravsik, Eleanor Queret, Francine Todisco, Helene Wahlers
James Webber, Ruth Carlson, *Economics*
William P. Larkin, *Prices, Wages, Indexes*
Evelyn Huber, Charlotte Foster, *Statistics*
D. Arlene Ricker, *Unit Prices*

Editorial Research and Indexing
Eva Glerat, Rene Hay, Jane Jacobson

Consulting Editors: **Van Tuyl Boughton, Nathan A. Bowers**

Advertising Sales Manager: **Donald S. Robertson**

Circulation Manager: **Edward F. Bressler**

Washington Bureau, National Press Bldg., Washington 4, D. C., George B. Bryant, Jr., Chief, Alan Adams, Glen Bayless, Roy Calvin, Anthony DeLeonardis, John Donaldson, Jay Flocken, Boyd France, Donald Loomis, Gladys Montgomery, Arthur Moore, Seth Payne, Dean Reed, Morton Reichek, Caroline Robertson, Dave Secrest, Vincent Smith.

Domestic News Bureaus: Atlanta—801 Rhodes-Haverty Bldg., B. E. Barnes, Chief, Frances Ridgway; **Chicago**—520 N. Michigan Ave., Stewart Ramsey, Chief, Bruce Cross, Lois Dubin; **Cleveland**—55 Public Square, Arthur Zimmerman, Chief, Violet Forsha; **Dallas**—901 Vaughn Bldg., Marvin Reid, Chief, Lorraine Smith; **Detroit**—856 Penobscot Bldg., Donald MacDonald, Chief, Sally Ayling, Wesley Perry, Jr.; **Los Angeles**—1125 W. 6th St., Kemp Anderson, Jr., Chief, Michael Murphy, Marvin Petal; **San Francisco**—68 Post St., Jenness Keene, Chief, Donald Winston, Alison Lunt; **Seattle**—6040 Fifth Ave., N.E., Ray Bloomberg.

Foreign News Bureaus: London—John Shinn; **Paris**—Robert Farrell; **Mexico City**—Peter Weaver; **Bonn**—Morrie Helitzer; **Beirut**—O. M. Marashian; **Tokyo**—Sol Sanders; **Rio de Janeiro**—Leslie Warren; **Caracas**—John Pearson; **Moscow**—Ernest Conine.

Correspondents: In 70 principal U. S. cities and 70 cities throughout the world.
Director of News Bureaus: John Wilhelm; **Managing Editor,** Margaret Ralston.
McGraw-Hill Economics Department: Dexter M. Keezer, Director.

Publisher, Robert F. Boger

ENGINEERING NEWS-RECORD. VOL. 165. No. 12. September 22, 1960

Published weekly by McGraw-Hill Publishing Company, James H. McGraw (1860-1948), Founder. Printed at Albany 1, N. Y. See panel below for directions regarding subscriptions or change in address. **Executive, Editorial, Advertising and Circulation Offices: McGraw-Hill Building, 330 W. 42nd St., New York 36, N. Y.** OFFICERS OF THE PUBLICATIONS DIVISION: Nelson L. Bond, President; Shelton Fisher, Wallace F. Traendly, Senior Vice Presidents; John R. Callaham, Vice President and Editorial Director; Joseph H. Allen, Vice President and Director of Advertising Sales; A. R. Venezian, Vice President and Circulation Coordinator. OFFICERS OF THE CORPORATION: Donald C. McGraw, President; Joseph A. Gerardi, Hugh J. Kelly, Harry L. Waddell, Executive Vice Presidents; L. Keith Goodrich, Vice President and Treasurer; John J. Cooke, Secretary. **Subscriptions are solicited only from persons with identifiable commercial or professional interests in construction and building. Position and company connection must be indicated on subscription orders.** United States subscription rate for individuals in the field of this publication $6.00 per year, single copies 50 cents; foreign $20 per year, payable in advance. Second-Class mail postage paid at Albany, New York. Printed in U.S.A. Title registered in U.S. Patent Office. ©Copyright 1960 McGraw-Hill Publishing Co., Inc. All Rights Reserved.
UNCONDITIONAL GUARANTEE: We agree, upon request to our New York office, direct from paid-up subscribers, to cancel any subscription if ENGINEERING NEWS-RECORD's editorial service is unsatisfactory, and will refund the proportionate subscription price of any unmailed copies.

SUBSCRIPTIONS: Send subscription correspondence and change of address to Fulfillment Manager, ENGINEERING NEWS-RECORD, 330 W. 42nd St., New York 36, N. Y. Subscribers should notify, publisher *promptly of any change of address, giving old as well as new address, and including postal zone number,* if any. If possible enclose an address label from a recent issue of the magazine. Please allow one month for change to become effective.

Postmaster: Please send Form 3579 to Fulfillment Manager, Engineering News-Record, 330 W. 42nd St., New York 36, N. Y.

60-3

SURE IT'S DRY...

And it's dry more than 15 feet below the level of the river, just a few feet away. What's more, there's an open end ramp that provides easy access to the excavated area. The Sioux River Diversion Dam is well on its way to completion, and the work is in the dry. This is the kind of thoughtful planning and efficient dewatering that is engineered into all STANG-dewatered projects: quick, clean, economical, and always dependable. Anywhere, anytime, be sure—call STANG.

JOHN W.
STANG
CORPORATION
8221 ATLANTIC AVE., BELL, CALIFORNIA

ENGINEERS AND MANUFACTURERS OF DEWATERING EQUIPMENT, WELLPOINTS AND PUMPING SYSTEMS • DEWATERING PLANNING—EQUIPMENT—SERVICE

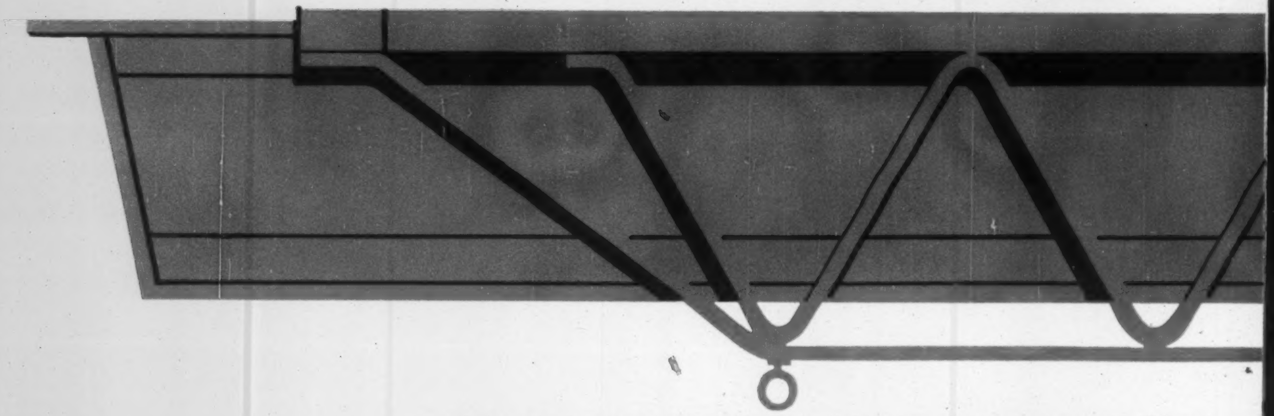
OMAHA TACOMA MOBILE TULSA MINNEAPOLIS ST. PETERSBURG

Contractor—Foley Bros., St. Paul, Minn.

slab-deck it faster...

SPECIFY REX® SPANALL

CONCRETE SHORING



SAVE TO 40% WITH THIS MODERN SHORING METHOD!

Stop the time and manpower wastes of "custom-built" shoring. Switch to Spanall—the factory-built, high-strength steel shoring that instantly adjusts to any span requirements. Spanall is telescopic for precision sizing, ease of handling, fast erection. Built-in camber compensates for load deflection. The elimination of "hodge-podge" vertical shoring gives added advantage of obstruction-free space below for workmen and storage. Save with Spanall on all your floor and deck shoring jobs as well as slabs of special shapes and sizes.

CALL THE REX-SPANALL DEALER NEAREST YOU—LET SHORING SPECIALISTS ENGINEER YOUR JOB!

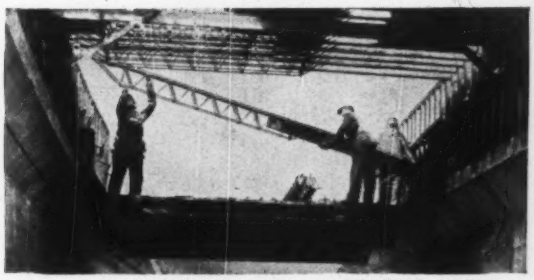
ARKANSAS: Finke & Williams, Inc., Little Rock • **CALIFORNIA**: Burke Concrete Accessories, Inc., San Francisco, Los Angeles, Oakland, San Bernardino, San Diego, Sacramento • **COLORADO**: K. C. Construction Supply Co., Inc., Denver • **CONNECTICUT**: Universal Builders Supply Co., Inc., New York • **WASHINGTON, D.C.**: Spanall Of The Southeast, Inc., Alexandria, Va. • **DELAWARE**: Furnival Machinery Company, Philadelphia • **FLORIDA**: Southern Spanall, Inc., Fort Lauderdale, Winter Park • **INDIANA**: Moss Engineering Corporation, Fort Wayne; M. S. Churchman Co., Indianapolis; American Builders Supply Co., Louisville, Ky. • **IOWA**: Edwards & Browne Co., Omaha, Nebr. • **KANSAS**: Victor L. Phillips Co., Wichita • **KENTUCKY**: American Builders Supply Co., Louisville, Lexington • **LOUISIANA**: H. S. Finke Corporation, New Orleans • **MAINE**: Universal Builders Supply Co., Inc., Framingham, Mass. • **MASSACHUSETTS**: Universal Builders Supply Co., Inc., Framingham • **MARYLAND**: Spanall of the Southeast, Inc., Alexandria, Va. • **MICHIGAN**: Safway Steel Scaffolds, Inc., Detroit; Metal Building Specialties Co., Kalamazoo, Grand Rapids, Lansing • **MINNESOTA**: The Zeco Company, Minneapolis, Duluth, Hibbing • **MISSOURI**: Victor L. Phillips Co., Kansas City; Missouri Construction Machinery Co., St. Louis • **NEBRASKA**: Edwards & Browne Co., Omaha • **NEVADA**: Burke Concrete Accessories, Inc., San Francisco • **NEW HAMPSHIRE**: Universal Builders Supply Co., Inc., Framingham, Mass. • **NEW JERSEY**: Universal Builders Supply Co., Inc., New York; Furnival Machinery Company, Philadelphia • **NEW MEXICO**: K. C. Construction Supply Co., Denver, Colo.; Burke Concrete Accessories, Inc., Albuquerque • **NEW YORK**: Universal Builders Supply Co., Inc., New York, Syracuse • **NORTH CAROLINA**: Spanall of the Southeast, Inc., Durham • **NORTH DAKOTA**: Midwest Equipment Company, Bismarck, Fargo • **OKLAHOMA**: Victor L. Phillips Co., Oklahoma City, Tulsa • **OHIO**: Safway Steel Scaffolds, Inc., Akron, Cleveland, Toledo; E. W. Harman Company, Columbus; F. E. Longstreth Company, Dayton; Durbrow-Otte Associates, Inc., Cincinnati • **OREGON**: Burke Concrete Accessories, Inc., Portland • **PENNSYLVANIA**: Furnival Machinery Company, Philadelphia, Harrisburg, New Philadelphia; Dravo-Doyle Company, Pittsburgh • **RHODE ISLAND**: Universal Builders Supply Co., Inc., Framingham, Mass. • **SOUTH CAROLINA**: Spanall of the Southeast, Inc., Durham, N.C. • **TENNESSEE**: Finke & Williams, Inc., Memphis; Wilson-Weesner-Wilkinson Co., Inc., Nashville, Knoxville • **TEXAS**: Dixie Form and Steel Company, San Antonio • **UTAH**: K. C. Construction Supply Co., Denver, Colo. • **VERMONT**: Universal Builders Supply Co., Inc., Framingham, Mass. • **VIRGINIA**: Spanall of the Southeast, Inc., Alexandria • **WASHINGTON**: Burke Concrete Accessories, Inc., Seattle • **WEST VIRGINIA**: Safway Steel Scaffolds, Inc., South Charleston; Dravo-Doyle, Pittsburgh, Pa. • **WISCONSIN**: Hunter Machinery Company, Inc., Milwaukee, Green Bay, Eau Claire.

THE COMPLETE REX-SPANALL LINE — WHAT YOU NEED, WHEN YOU WANT IT, RENTAL OR SALES

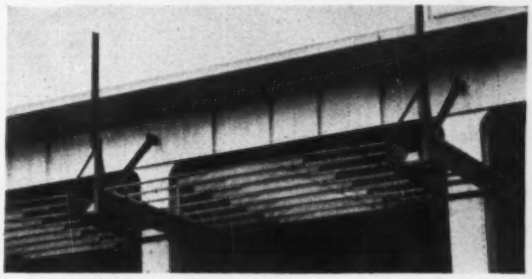
REX-SPANALL 46
Channel-shaped steel members for formwork from 4'2" to 6'11".

REX-SPANALL 610
For medium-span building and bridge formwork. Telescopic members adjust from 6'1" to 10'2".

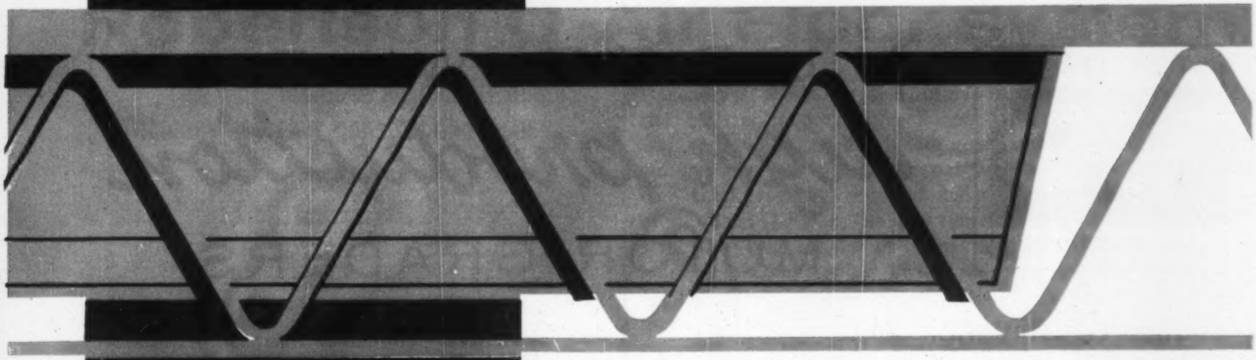
REX-SPANALL 1015
Perfect for multi-story form construction with adjustable spans from 9'11" to 21'.



Thousandths-of-an-inch accuracy was a must in this foundation for the huge new Brookhaven Synchrotron. Spanall simplified roof formwork with its precision expansion feature. Foundation contractor: Stone & Webster Engineering Corporation.



Bridge construction speeded with Spanall. Time and manpower savings are apparent here where Spanall eliminated difficult vertical shoring for a width addition to the George Washington Bridge, New York. Contractor: Tully and DiNapoli, Inc.



REX-SPANALL 730
The standard truss assembly for long-span and heavy-load formwork from 7' to 30'.

REX-SPANALL VERTICAL SHORING
Easily handled telescopic shoring has precision adjustment for rapid setting. Available in three sizes from 5'7" to 14'1".

REX® SPANALL

Subsidiary of CHAIN Belt Company, Rex-Spanall, Inc.,
6427 West Capitol Drive, Milwaukee 16, Wisconsin. Export:
Rex-Spanall International, S.A., Santurce, Puerto Rico

CIRCLE 5 ON READER SERVICE CARD

LOUIS GARAVAGLIA CONTRACTORS, INC., prominent Detroit, Michigan, contractor, uses a new Huber-Warco 10-D motor grader on a 3-mile section of 21 Mile Road north of Mt. Clemens. The contract involves a new dual lane highway connecting Rt. U. S. 25, M59 and the Edsel Ford Expressway to Selfridge Field. The 10-D is used for ditching, banksloping, leveling fill, maintenance of haul roads, and finish grading.

HUBER WARCO

HUBER-WARCO
high production
MOTOR GRADERS

RUGGED CONSTRUCTION—Heavy-duty frame, circle, drawbar, drive units and other components, combined with dependable diesel engines, assure years of low-cost service on any type of grading assignment.

HYDRAULIC CONTROLS—Complete blade control without leaving the cab—including all bank sloping positions. Precise control is ideal for finish grading. Ease of operation means less operator fatigue and more production.

EASY SHIFTING—Full constant-mesh transmission, including range shift, enables operator to shift while moving. Shifting one lever reverses direction in same gear. Six speeds in both forward and reverse. Optional creeper gears give three additional speeds in forward and reverse. Ball and tapered roller bearings used throughout the transmission and final drive assemblies. A pressure flood system assures positive lubrication of every bearing, gear and shaft under all conditions.

A trusted product name backed by respected distributor names from coast to coast

MOTOR GRADERS

Standard transmission models from 83 to 160 H.P. Torque converter and power shift transmission models from 102 to 195 H.P.

TANDEM ROLLERS

3-5 Ton • 4-6 Ton Retractable • 5-8 Ton • 8-10 Ton • 8-12 Ton • 10-14 Ton

3-WHEEL ROLLERS

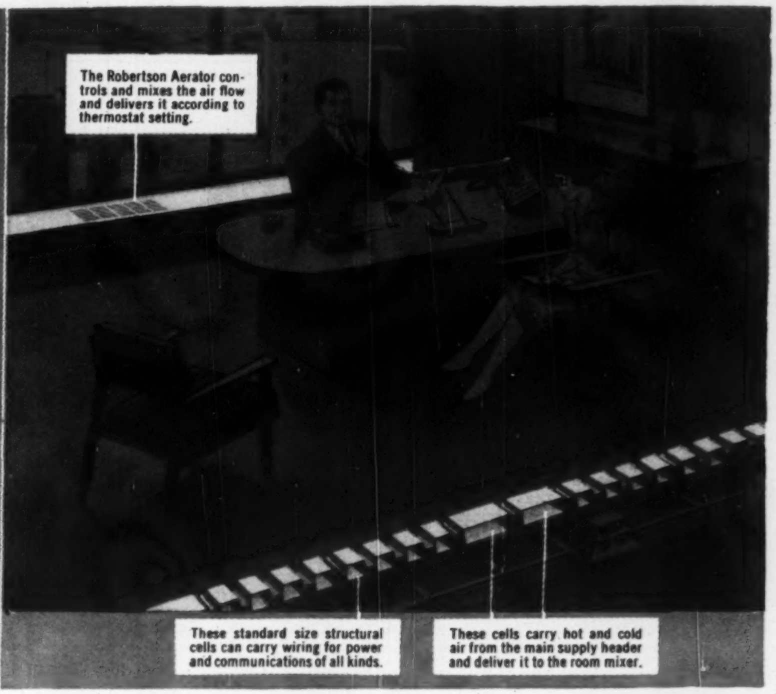
10-Ton • 12-Ton • 14-Ton Standard Weight 10-12 Ton • 12-14 Ton Variable Weight

MAINTAINER

M-52 — 45½ H.P. Attachments are Lift-Loader, Broom, Bulldozer, Patch Roller, Scarifier, Snow Plow, Berm Leveler

HUBER-WARCO COMPANY **Marion, Ohio, U.S.A.**

Cut Capital And Annual Costs With



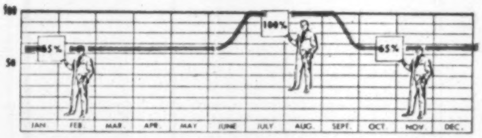
The Robertson Aerator controls and mixes the air flow and delivers it according to thermostat setting.

These standard size structural cells can carry wiring for power and communications of all kinds.

These cells carry hot and cold air from the main supply header and deliver it to the room mixer.

Robertson Q-Air Floor system

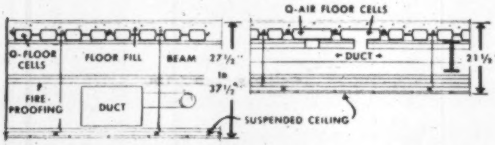
. . . increase air conditioning efficiency and save construction money



During the winter, Robertson Aerators satisfy heating requirements at 65% of peak volume.

For peak summer cooling, aerators deliver 100% volume and system runs at full power.

As cold weather approaches, changeover device adjusts system back to 65% of peak volume.



Simplified cross sections of ceiling-to-floor-above areas show old way left and Q-Air Floor right. Average compaction is one foot.

Basically, Q-Air Floor is an outgrowth of Robertson Q-Floor, the quarter-century-old cellular steel subflooring system which provides quick, efficient construction and continuous wiring raceways in more than 15,000 buildings. Within its own thickness, and without disturbing the 2-foot module of standard Q-Floor, the new system provides pairs of wide structural cells for use in connection with dual-duct, high-velocity air conditioning. These load-bearing cells are adapted by the air conditioning contractor to transport air from horizontal supply ducts to mixing units for discharge into the room.

The advantages of Q-Air Floor are threefold. The system includes the exclusive and patented Robertson Aerator, a mixing device with a seasonal changeover feature which keeps blower power at 65% of capacity except during peak summer load. Yearly power cost can be reduced as much as 30%. Since Q-Air Floor saves an average of a foot in depth per floor section, as much as 5% in building material cost can be saved—depending on the rise of the building. And this compaction inevitably results in up to an 11% reduction in overall BTU requirements.

Robertson
Q-AIR Floor
H. H. Robertson Company
2420 Farmers Bank Building, Pittsburgh 22, Pa.

In England—Robertson Thain Ltd., Ellesmere Port, Cheshire
In Canada—Robertson-Irwin Ltd., Hamilton, Ontario • Edmonton, Alberta

Use the coupon for further information about this revolutionary system—already in successful use in a number of splendid buildings.

NAME____________________ TITLE__________
COMPANY______________________________
ADDRESS______________________________
CITY____________________ STATE__________

←CIRCLE 6 ON READER SERVICE CARD

CIRCLE 7 ON READER SERVICE CARD

seboat Owners Shun Bustle of City anc

t Club
usiness
Pleasure

f combining busi-
sure is being in-
e exclusive Rac-
alm Springs with
cquet Club Cot-

the idea is based
that highly suc-
tive men in busi-
't wish to get too
their business—at
long stretches of
by the end of the
two there is a
know how every-
at the office.
e highly success-
ke the work they
d while they talk
to get away from
ly don't want to—
far away. On the
e wife thinks if she
e income producer
e office for at least
e winter she isn't
as a helpmate.
art of the "Racquet
" idea fits into a
ness problem that
ith manpower. In
etition these days,
b to fill lies in the
0,000 bracket. Men
rning this kind of
hard to find and equally hard to move once you have found them.

If a man earning $75,000 is offered $85,000 by another company, the $10,000 gain amounts to very little net after taxes. Then, as an added incentive, "fringe benefits" are often included ranging all the way from insurance to stock options. While most of these fringe benefits are important they aren't very dramatic, at least not to the lady of the family, and oftentimes they are not even very well understood by the man of the house. What she wants in the way of fringe benefits is some fun, not more insurance.

The "Racquet Club Cottages" idea is designed to provide kind of a fringe benefit that is practical and understandable.

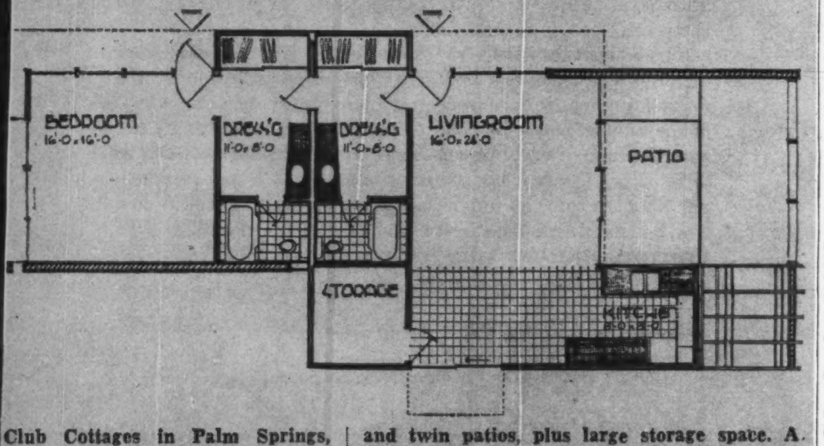
The plan was worked out last year when Robert S. Morton of Pasadena, Calif., John D. Murchison, and Clint W. Murchison, Jr., of Dallas bought the 25-year old Racquet Club from Charles Farrell, who remains as president of the club.

Seventy cottages are being built on the club grounds. Each cottage is a completely self-contained unit with its own kitchen, dining alcove, living room, bedroom, patio, and so on, and these units are being offered to a limited number of people who fall into two groups.

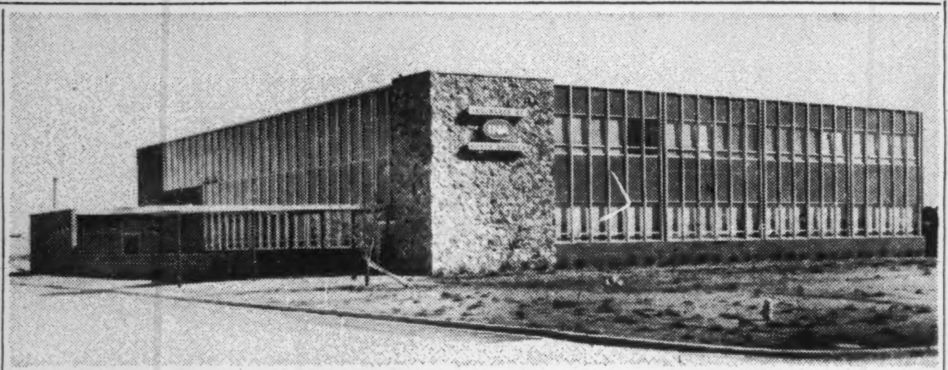
First, the retired person who wishes to have a permanent home in the desert but doesn't want the bother and expense of trying to maintain a home.

The second group is the business executive who wants to take a winter holiday but who doesn't want to be too far away from his work.

Therefore, the businessman on vacation can still spend his day in the sun and at the same time keep in touch with the office.



Club Cottages in Palm Springs,
e from bachelor apartments to fully
nd fully staffed homes (layout
ving a 16-by-24-foot living room,
ot bedroom, twin dressing rooms
vanity counters, and baths, kitchen, and twin patios, plus large storage space. A dining space runs between the kitchen and living room. What you cannot see in the diagram is the magnificent views of mountains, lawns, and gardens through sliding glass doors and windows.



The Insurance Company of North America has moved into its new headquarters in Dallas, a structure that utilizes a new fire-protective acoustical ceiling. Julian Barry was general contractor. Broad & Nelson were the architects.

Acoustic Tile Helps Builder Meet Deadline

A new fire-protective acoustical ceiling tile helped solve a tough construction problem for building contractor Julian Barry.

The problem arose late last December as Mr. Barry was pressing hard to complete a portion of the second floor of the Insurance Company of North America building in Dallas in time to meet a Feb. 1 deadline.

Unfortunately, a long siege of cold, wet weather moved into Dallas at the time, causing immediate difficulty with the ceiling installation. And because of the excessive moisture in the atmosphere, it became apparent that the wet plaster work would take much longer to dry than usual. This in turn, threatened to delay other finishing operations, and eliminate any chance of having the second-floor offices ready for occupancy by Feb. 1.

Mr. Barry realized that the only solution to the problem was to substitute another type of acoustical ceiling—one that could be installed by a completely "dry" method, yet still provide the necessary two-hour fire protection for the structural steel components above the ceiling.

An Armstrong Acoustical Fire Guard met these requirements.

The Fire Guard shipment was delivered to the job site in five days, and the United Tile Company crew began work the following morning. The entire installation, involving nearly 7,000 square feet of ceiling area, took less than a week to complete.

Families
From Ow

Thousands of famili
finding that hard-to-get,
water-front property is
hard to get after all;
costly to buy.

They are buying "floa
lands" with water on fo
and the pleasurable ab
move from one scene to
whenever the mood su
occasion.

What is more, they pa
tically no taxes, and h
land assessments or main
chores. You can buy thes
ing apartments for far le
the cost of a new summ
on land.

What are we talking a
houseboat, of course, a
that is skyrocketing so
similar to the over-all
boom. Take one houseb
36 feet by 10 feet in are
it with an outboard m
two, launch it on any on
nation's larger waterwa
you have the ingredien
leisurely vacation away
highway traffic rush, or
mer home with many of
uries of intown living
country.

Few crafts of the wa
offer so much for the
spent on them. Deprec

Porch, upper sun d
ters are the componen
close-to-shore cruisin

A COAST TO COAST REAL ESTATE DIRECTORY

lorida
(Continued)
AUDERDALE, FLA.
containing two 2-bed-

Idaho
IN THE LAND OF FERTILE VALLEYS
and Scenic Splendor. Free information.

Indiana
(Continued)
408 ACRES LEVEL, 15 mi. South Bend.
2 sets buildings, 4 silos. Contract pref.
M. I. Clark, North Liberty, Ind.

Massachusetts
(Continued)
HINGHAM & VICINITY
Where Boston Meets
the South Shore

New Jers
"Good Houses—Good
G. KIMBALL COLE
Realtor
288 Main St., Chatham

Newspapers and magazines report . . .

How new Armstrong Acoustical Fire Guard can help contractors meet construction deadlines

THE ARTICLE on the left* tells what Armstrong Acoustical Fire Guard did for a general contractor and his client. It might do the same for you and your client.

As the story states, Acoustical Fire Guard is installed by a completely "dry" method. Other trades don't have to mark time waiting for the interior to dry.

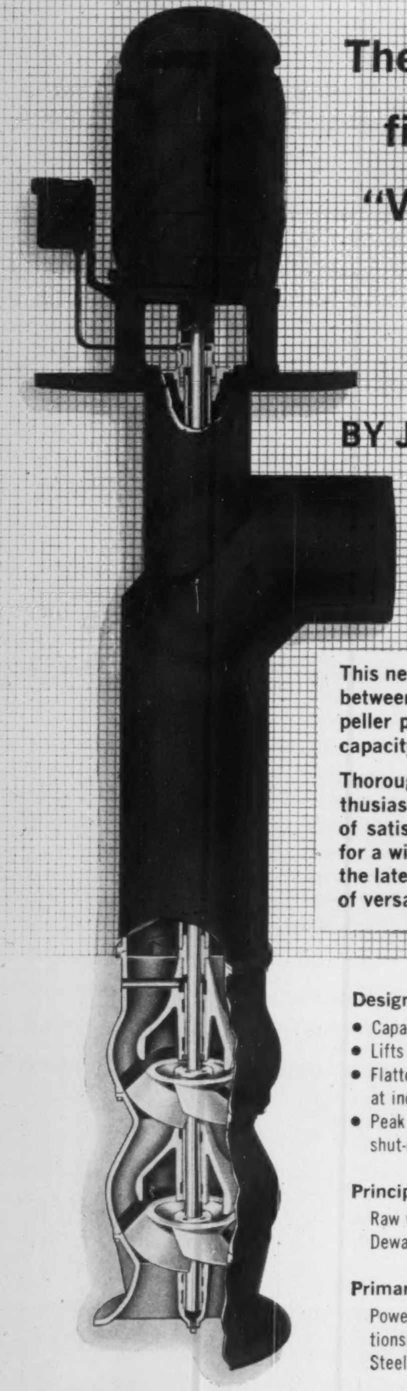
For more information about new Armstrong Acoustical Fire Guard, the first time-design-rated acoustical tile, write Armstrong Cork Company, 4209 Wallace Street, Lancaster, Pennsylvania.

* REPRINTED BY PERMISSION OF THE CHRISTIAN SCIENCE MONITOR.

Armstrong ACOUSTICAL CEILINGS

1860 — 1960 Beginning our second century of progress

CIRCLE 9 ON READER SERVICE CARD



The pump that fills the "Vital Gap"

NEW MIXED-FLOW BY JOHNSTON

Large capacities at medium lifts

This new Johnston fills the "vital gap" between low head—large capacity propeller pumps and high head—smaller capacity regular turbines.

Thoroughly field-tested and already enthusiastically recommended by a score of satisfied users, it is now available for a wide range of applications and is the latest addition to the Johnston line of versatile vertical pumps.

Design Features:

- Capacities exceeding 100,000 gpm.
- Lifts from 20 to 60 feet.
- Flatter hp curve means less overload at increased heads.
- Peak performance at 40 to 60% of shut-off head.

Principal Applications:

Raw water intake; Low lift transfer; Dewatering; Spray pools; Sewage effluents.

Primary Users:

Power plants; Sewage treatment installations; Flood control; Land reclamation; Steel mills, refineries, chemical plants, etc.

For complete details and specifications, call or write your nearest Johnston distributor or contact the factory direct.

JOHNSTON PUMP COMPANY
A DIVISION OF THE YOUNGSTOWN SHEET AND TUBE COMPANY
3272 East Foothill Boulevard, Pasadena, Calif.

Branch Warehouses: Roswell, N. M.; Hastings, Neb.; Pecos, Texas; Idaho Falls, Idaho

Reader Comment

Concreting Records

Kurobe pace awakens Grand Coulee memories

SIR—The placement of 11,318 cu yd of concrete in a 24-hour period on a Japanese project (Kurobe Dam ENR Aug. 4, p. 15) is an impressive production figure for a plant with two 25-ton cable ways. For one day's placement on the project, it is far short of the record of 20,684 cu yd placed in the second stage of Grand Coulee Dam. It is also short of the 11,790 cu yd record at Shasta Dam, completed in 1945.

My recollection is that in 1937, on the first stage of Grand Coulee Dam, the Mason-Walsh-Atkinson-Kier group placed a daily average in excess of 13,000 cu yd for a 60-day period.

C. DOUGLAS RIDDLE
Riddle and Taylor
Consulting Engineers
Atlanta, Ga.

SIR—My records show a total of 32 months in which more than 200,000 cu yd were poured per month for Hoover, Grand Coulee, Shasta, Friant and Hungry Horse Dams. This volume is the result of consecutive average daily pours of 7,000 cu yd. Since Hungry Horse Dam had several days when over 9,000 cu yd were poured, it seems likely that the other dams did also.

In fact, in one month at Grand Coulee, 504,000 cu yd were poured, an average of 16,500 cu yd per day. If memory serves correctly, the top day at Grand Coulee saw about 22,000 cu yd placed. This would be about maximum for eight 4-cu-yd mixers with two-minute mixing cycles.

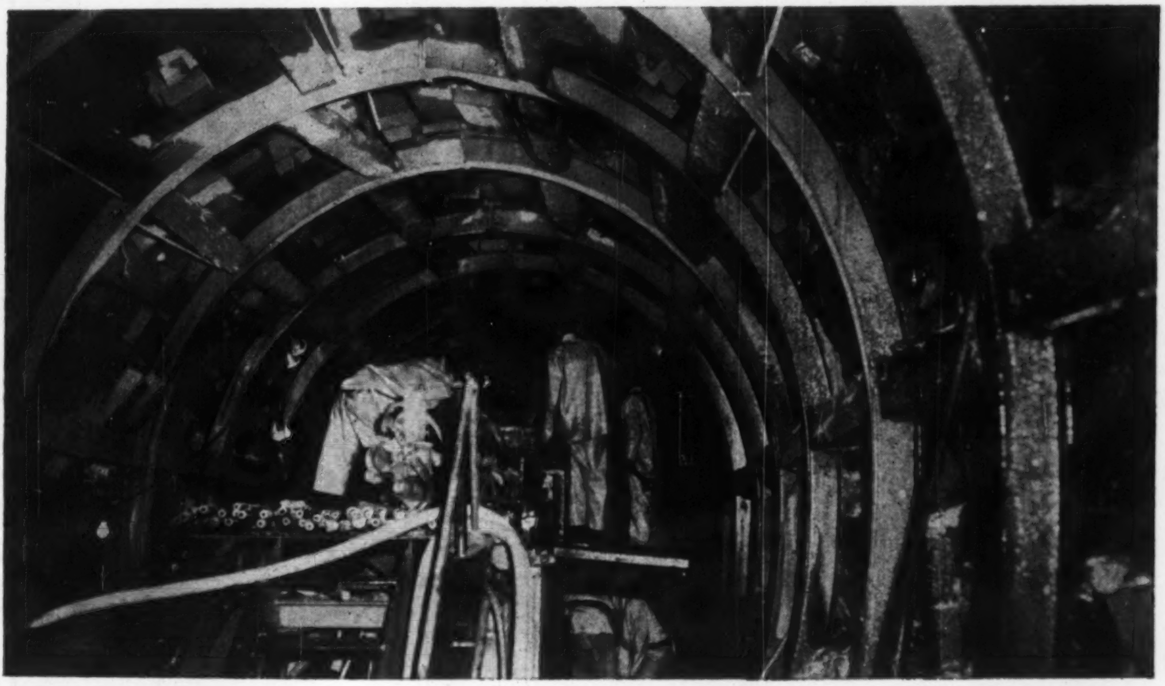
Since the space available and the equipment placing the concrete most directly determine the output from a mix plant, there are probably other large dams with maximum rates in the 9,000 to 11,000-cu-yd-per-day class. Also, it would not be at all surprising if some of the thick airport runways were not in this class.

A. J. JOHANNESEN
Office Engineer
General Construction Co.

SIR—Would you consider the amount of concrete placed in construction of Grand Coulee as being comparable to

(Reader Comment continued p. 18)

Engineering News-Record welcomes expression of opinions from its readers. Comment should be as brief as possible and pertinent to subjects of current construction importance. Letters should be addressed, Editor Engineering News-Record, 330 W. 42nd St., New York 36, N. Y.

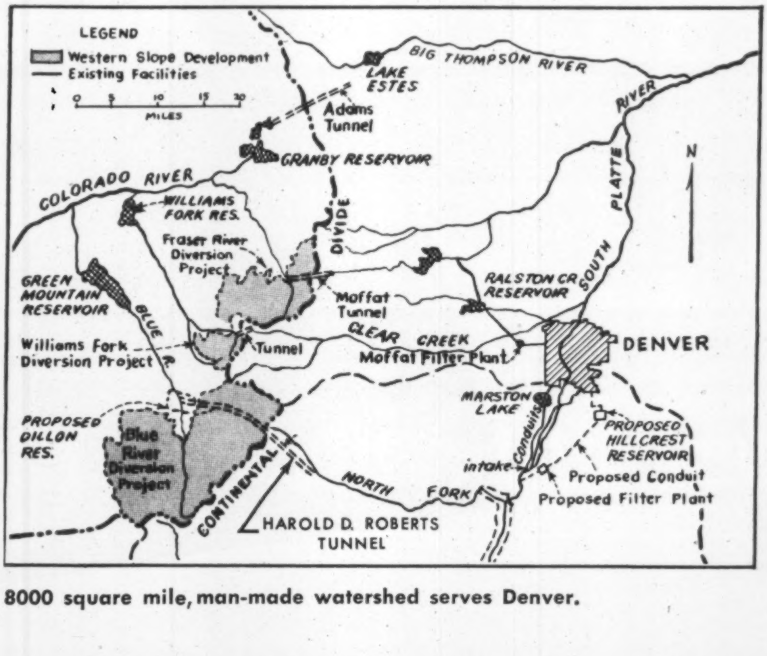


How COMMERCIAL tunnel supports pierce Rockies

As far as water supply is concerned, Denver is on the eastern or wrong side of the Continental Divide. To quench the thirst of Denver's growing population (present water supply will be inadequate by 1970), a $101-million project to tap the Blue River of the water-rich western slope is boring to completion in 1962. An all-important part of this project is the 23 mile long Harold D. Roberts Tunnel.

Tough water problem in tunnel

The first 8½ miles of tunnel lie 600-800 ft. beneath the Snake River through rock faulted with frequent mud slips and high pressure water seams. Here high pressure water, 700 gpm, unchecked by 1500 psi grouting, was encountered and slowed the advance until grout was pumped in four holes drilled 200 ft. into the heading. Bore of tunnel is horseshoe-shaped, 13 ft. 3 in. high and 12 ft. 6 in. wide at springline. In all, 17¼ miles of the tunnel required supports. Standard pattern of support in Pierre shale was COMMERCIAL 6" WF beams @ 20#/ft., spaced normal on 5 ft. centers. In badly faulted areas of pegmatite, schists, quartzites, gneiss, and coarse-grained, mineralized granite with mud slips and seams, support required spacing down to 2½ ft. centers and 8" WF beams @ 31#/ ft.


LEGEND
Western Slope Development
Existing Facilities
0 5 10 15 20
MILES
BIG THOMPSON RIVER
LAKE ESTES
Adams Tunnel
GRANBY RESERVOIR
RIVER
N
COLORADO RIVER
WILLIAMS FORK RES.
DIVIDE
PLATTE
SOUTH
Fraser River Diversion Project
GREEN MOUNTAIN RESERVOIR
BLUE R.
Moffat Tunnel
RALSTON CR RESERVOIR
CLEAR CREEK
Williams Fork Diversion Project
Tunnel
Moffat Filter Plant
DENVER
MARSTON LAKE
PROPOSED DILLON RES.
Blue River Diversion Project
CONTINENTAL
Conduits
PROPOSED HILLCREST RESERVOIR
intake
NORTH FORK
Proposed Conduit
Proposed Filter Plant
HAROLD D. ROBERTS TUNNEL

8000 square mile, man-made watershed serves Denver.

32 years of COMMERCIAL supports

Entire Denver water supply complex, dating back to early pioneers, will be served by four tunnels: Moffat, Adams, Williams, and Roberts. COMMERCIAL steel supports served Moffat Tunnel (1928), Williams Tunnel (1937), Adams Tunnel (1940). For your next project, COMMERCIAL technical service, backed by over 30 years experience, is available to you for on-the-spot engineering help in tough situations. Write to the Commercial Shearing & Stamping Co., Dept. E-39, Youngstown 1, Ohio.

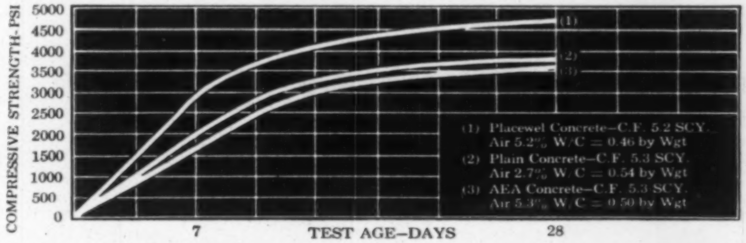
COMMERCIAL
shearing & stamping

Increase concrete strength 30% with J-M Placewel...

the liquid admixture that gives you 5 key controls of concrete

Placewel®, a product of Johns-Manville, world's largest industrial user of portland cement, permits a new high in compressive and flexural strength. This superiority has been proved in millions of yards of concrete.

Placewel is a water-reducing, dispersing agent *plus* a catalyst. It is available with or without an air entraining agent. Placewel, by breaking up the cement flocs, releases water for lubrication that isn't normally available. Thus, mixing water requirements are cut without relying on air entrainment alone. The Placewel catalyst enhances the strength-gaining characteristics of portland cement. This unique combination of properties provides a 30% increase in concrete strength (see chart).



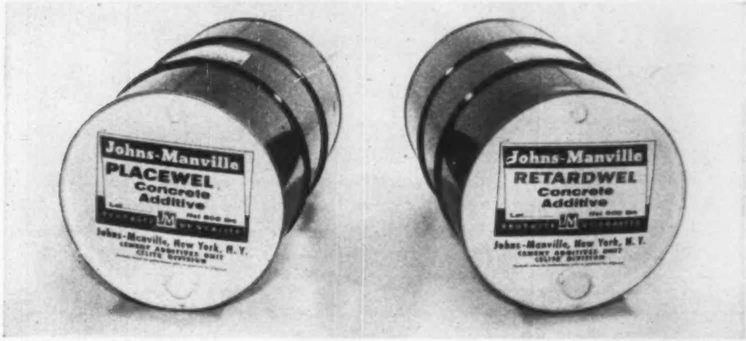
Compressive strength — performance of Placewel vs. plain and air entrained concrete

Less than three ounces of Placewel per sack of cement will also —

- Increase durability 350%
- Increase workability
- Improve dimensional stability
- Reduce permeability

J-M Retardwel® is recommended when concreting conditions require longer placing and finishing time. Retardwel delays the initial set of concrete and yet provides higher 24 hour strength.

Architects and engineers the world over have learned that Placewel and Retardwel give them complete control over the concrete they specify. For full information and technical assistance write: Johns-Manville, Box 14, New York 16, N. Y.

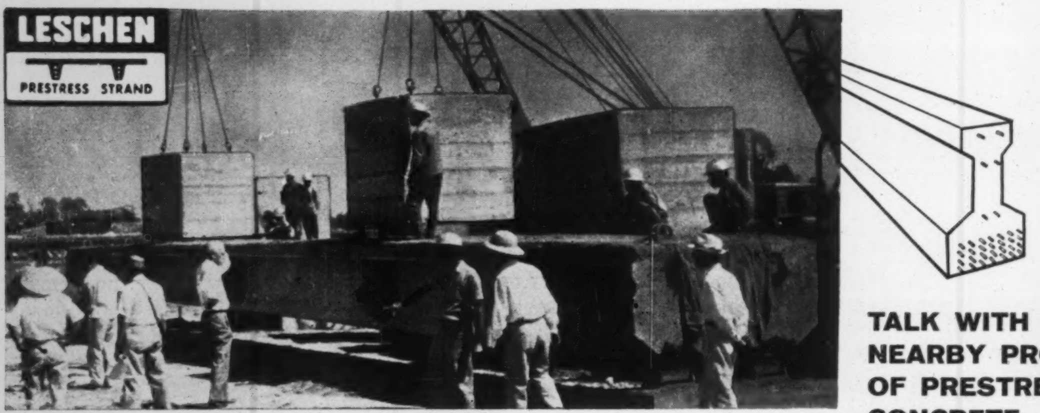


JOHNS-MANVILLE

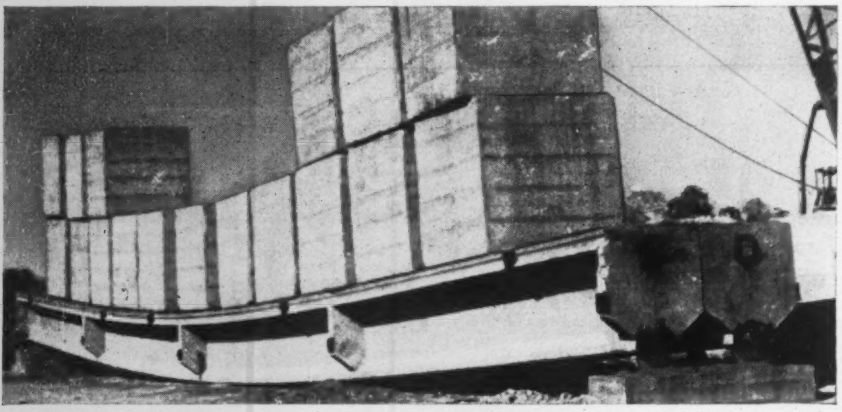
JOHNS-MANVILLE JM PRODUCTS

Celite Division

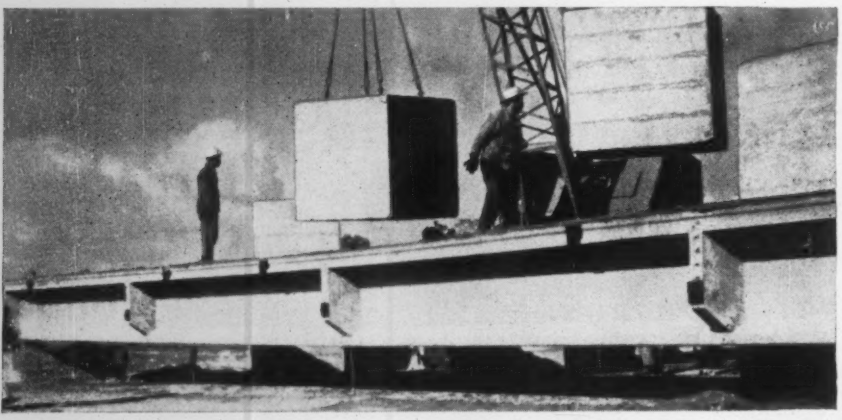
CIRCLE 13 ON READER SERVICE CARD



START OF TEST LOADING on two 80-foot prestressed girders. Each contains 26 Leschen Prestress Strands under tension.



153-TON LOAD—more than four times design load. Deflection was 24 inches with no failure of concrete or strand. Test made for acceptability of 1400 girders for South Vietnam construction project.



LOADS REMOVED—approximately 85% recovery of deflection immediately. Only hairline cracks evident. Designer—Capital Engineering Corp.; General Contractor—Johnson, Drake & Piper of Vietnam, Inc.; Technical Assistance—Freysinnet Co., Inc.

TALK WITH A NEARBY PRODUCER OF PRESTRESSED CONCRETE

He can discuss technical problems, point to examples of prestressed construction in your area, and advise on costs and delivery of beams from his yard.

LESCHEN
PRESTRESS STRAND
H. K. PORTER COMPANY, INC.

OR WRITE LESCHEN

Leschen supplies producers with the tensioning material—prestress strand. To insure uniform production of highest quality tensioning steel, Leschen has installed the world's newest and most modern wire mill and other specialized equipment. Write for literature giving typical uses and engineering data.

Leschen Wire Rope Division,
H. K. Porter Company, Inc.,
St. Louis 12, Missouri.

PRESTRESSED BEAM WITHSTANDS 4X DESIGN LOAD!

Prestressed concrete is unique. Its properties are a delight to creative architects and engineers. Thinner sections, longer spans, lower depth-to-span, longer cantilevering without ballast beams, reduction in weight, economy, architectural beauty. These and other advantages are a challenge to creative designers.

LESCHEN WIRE ROPE DIVISION **PORTER** ***H. K. PORTER COMPANY, INC.***

PORTER SERVES INDUSTRY with steel, rubber and friction products, asbestos textiles, high voltage electrical equipment, electrical wire and cable, wiring systems, motors, fans, blowers, specialty alloys, paints, refractories, tools, forgings and pipe fittings, roll formings and stampings, wire rope and strand.

CIRCLE 14 ON READER SERVICE CARD

Blood Brothers Drive Assemblies help give power "pay-off" in

TOUGH HOUGH PAYLOADER®

Many outstanding improvements have made this Hough Model H-90B Tractor Loader a proven leader in its field. Available with 1½, 3 and 5 cubic yard capacities, it offers a full 50° bucket-dumping angle, plus maximum lifting height and reach for loading large hauling units.

The lower-front drive shaft and lower-rear drive shaft used on this latest equipment were manufactured to exacting specifications by Blood Brothers. It is typical of the many quality drive assemblies Blood Brothers furnish for special equipment of all sizes.

Rockwell-Standard's Universal Joint Division offers a wide range of specialized engineering experience – involving everything from manual steering assemblies . . . to power take-off drives . . . to heavy-duty propeller shafts.

If you are planning or designing new equipment, consult our engineers for important savings in time and money. A letter or phone call will bring cooperative, friendly, experienced assistance.

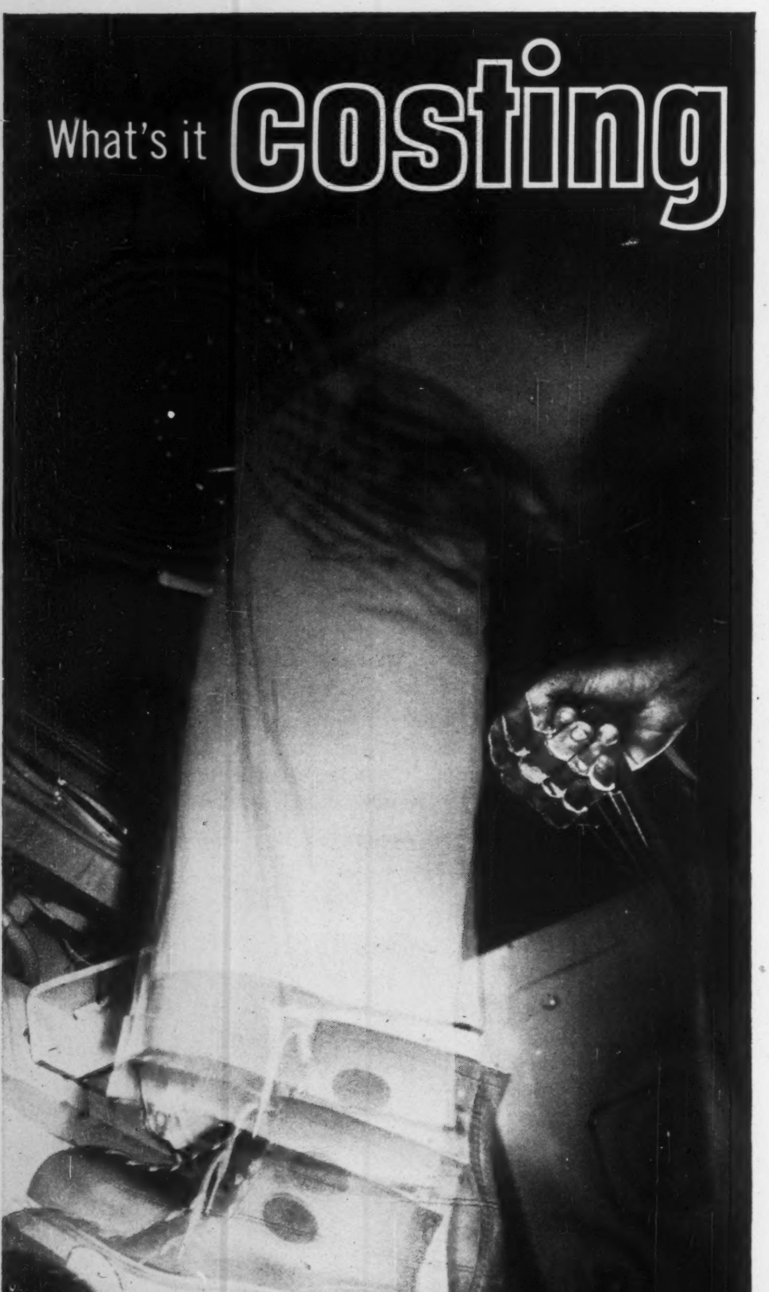
Write for complete information

Another Product of

ROCKWELL-STANDARD
CORPORATION

ROCKWELL R STANDARD

Universal Joint Division, Allegan, Michigan



What's it costing you to train new drivers?

$1,000? $1,500? $2,000? These are normal costs for training new operators —except for TORQMATIC DRIVE owners. They report saving up to $2,000 every time they break in a "rookie."

Reason? TORQMATIC takes guesswork out of shifting – ends shock-load damage and the need for engine-disconnect clutch repairs. TORQMATIC *automatically* adjusts engine output and speed to load or terrain changes.

TORQMATIC owners know that no operator can handle the "stick" and clutch as smoothly and efficiently—*every* time – as an Allison TORQMATIC. They bought TORQMATIC because they know, too, what it costs when rookies make a shifting and clutching mistake.

How can you eliminate these costs?

Look beyond first cost and see the total cost. Then change from clutch-pedal equipment to Allison TORQMATIC. You'll save costly engine-disconnect clutch replacements, too-frequent overhauls of overtaxed engines, repair bills for shock-load-damaged axles and drive lines.

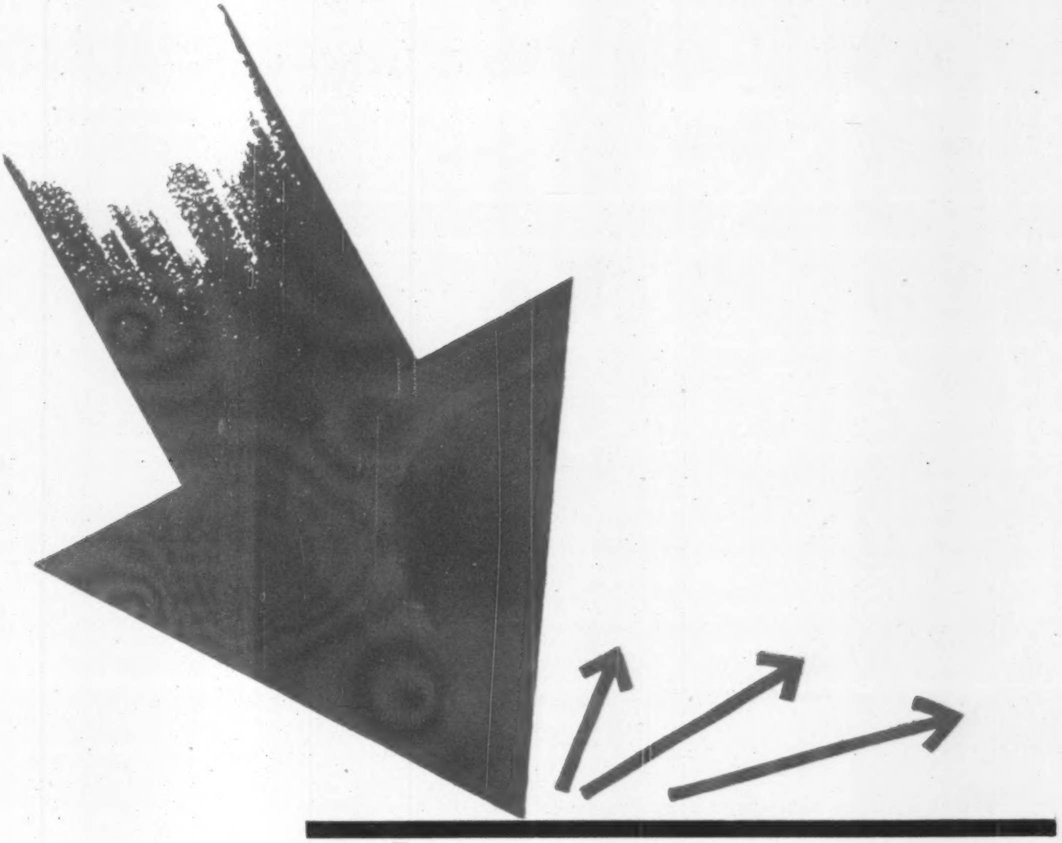
Why not get the full story today? See your equipment dealer or write Allison.

ALLISON DIVISION OF GENERAL MOTORS
Indianapolis 6, Indiana
In Canada: General Motors Diesel Ltd.,
London, Ontario

Allison TORQMATIC

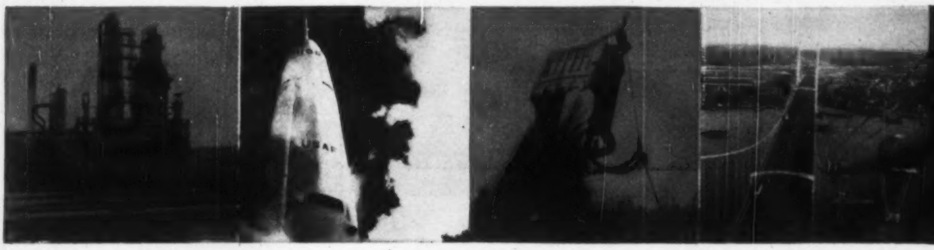
TORQMATIC® DRIVES

THE MODERN DRIVE FOR MODERN EQUIPMENT



Metallurgical Phenomena... and the metals to cope with them. These are the stock-in-trade of the Lukens Application Engineer—whether the problem be one of abrasive impact (symbolized above) or corrosion or pressure or structural stress or high and low temperature. Investigation of the best steels for "problem" applications has been carried on for years by the Lukens Application Research team. We would welcome the opportunity to contribute the results of this research to your own design knowledge. Please contact us in your early design stages. Call collect: Joe Proctor, Manager of Application Engineering, Extension 422, Lukens Steel Company, Coatesville, Pennsylvania.

HELPING INDUSTRY CHOOSE STEELS THAT FIT THE JOB



LUKENS STEEL

CIRCLE 17 ON READER SERVICE CARD

Busy contractors demand Ramset

INSIST ON THE
RED TIP FASTENER WITH THE W TOP

WHERE FASTENING MUST BE QUICK AND TROUBLE-FREE

Securing perimeter plates to concrete slabs in split-seconds . . . this is another of the countless jobs Ramset powder-actuated fastening does where time means money. A trigger pull sets a rugged Red Tip fastener permanently . . . no muss, no fuss, and no tedious pre-drilling!

Ramset is a safe, proved system for driving exclusive austempered threaded studs and drive pins into concrete or steel— up to fifteen times faster than old-fashioned methods! Offering industry's widest selection of dependable fasteners, tools and powder charges, Ramset is your best buy for economical, fool-proof fastening. Call your Ramset dealer (under "Tools" in Yellow Pages) or write direct for money-saving literature and details.

Ramset® Fastening System

OLIN MATHIESON · WINCHESTER-WESTERN DIV. · 287-I WINCHESTER AVE. · NEW HAVEN 4, CONN.

the records you mention? Concrete placed at Grand Coulee, while I was there with the Bureau, was produced by two MWAK mixing plants assembled in a single building.

Perhaps you have considered this factor in announcing the "new one-day speed record" by the Japanese. However, you may want to know that the following concrete production was achieved at Grand Coulee: 20,696 cu yd was placed on May 25, 1939; 536,264 cu yd was placed during October 1939, for a 31 day average of 17,300 cu yd.

FRANK A. MUELLER
Chief, Design Branch
Regional Division of Design and Construction
U.S. Bureau of Reclamation

SIR—With all due credit to the claim of a Japanese firm to a one-day speed record for concrete placement, we would like to report that on May 29, 1944, during construction of Fontana Dam in western North Carolina, TVA construction forces placed 11,419 cu yd of concrete.

We note also your belief that the previous record was 8,376 cu yd achieved at India's Bhakra Dam four years ago. We would like to complete your records to show that during the month of May 1944, TVA placed 241,211 cu yd or a daily average for 27 work days of 8,934 cu yd.

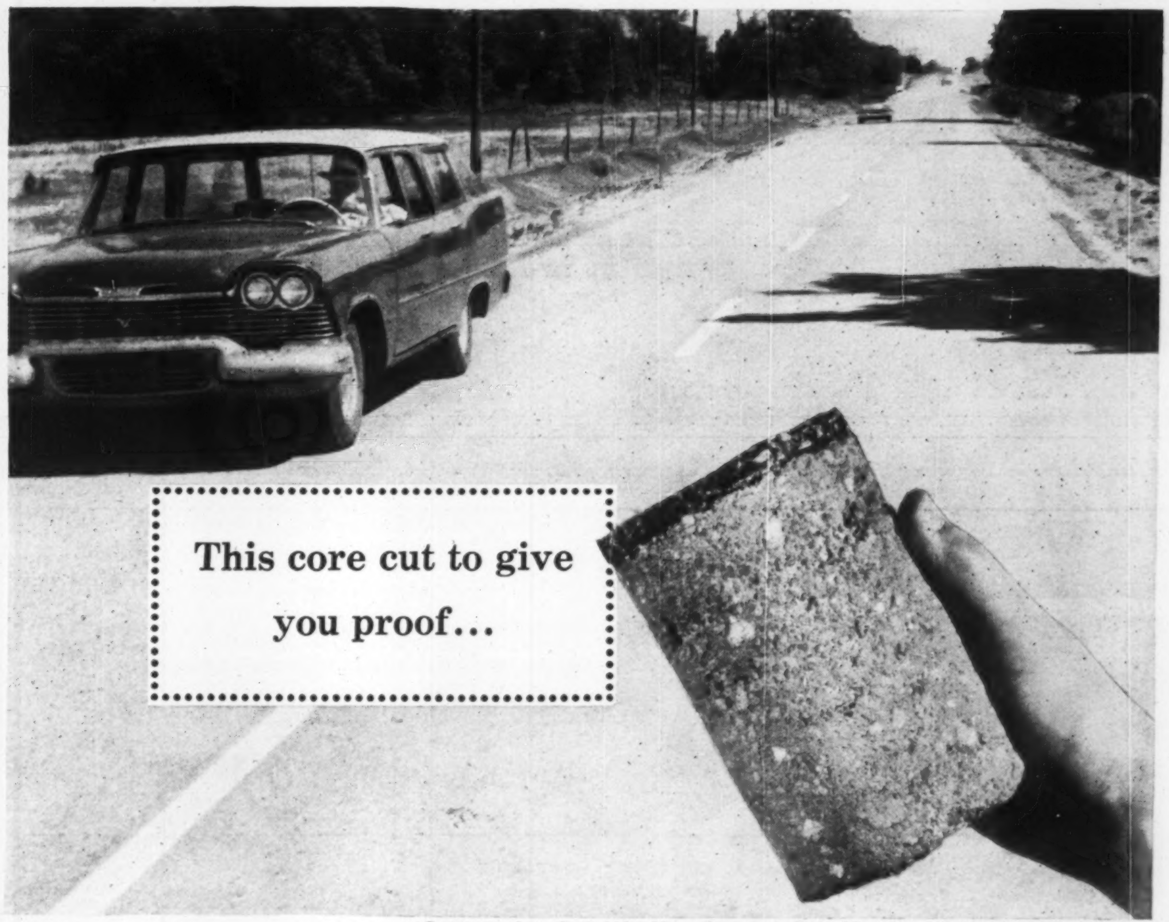
PAUL L. EVANS
Director of Information
Tennessee Valley Authority
Knoxville, Tenn.

Editor's Note: The numbers jumble has cleared up two points; **(1)** the 11,318-cu-yd day at Kurobe was indeed far short of *the* record pour; and **(2)** so much concrete was poured at Grand Coulee that no two people seem to agree on how much.

We called Francis Donaldson who was there as chief engineer for the Mason-Walsh-Atkinson-Kier combine for one year. He kept close touch with the project when he resumed his present post as vice-president and director of Mason & Hanger-Silas Mason & Co., Inc., and his office confirmed May 25, 1939, as the day of the record pour at Grand Coulee. However, he gives 20,432 cu yd as the volume poured on that day. He too points out that October, 1939, was the record month, but 530,475 cu yd is his figure. Mr. Donaldson recalls, as does Mr. Riddle, who succeeded him on the project, that during one 60-day period, concrete pouring on the first stage of Grand Coulee averaged over 13,000 cu yd per day.

Mr. Johannsen's records serve further to discount the Kurobe pour. As the son of a Bureau of Reclamation engineer, he worked summers at Grand Coulee and later became field engineer for General-Shea-Morrison at Hungry

(*Reader comment continued p. 26*)



This core cut to give you proof...

County road south of Alda, Nebraska, was built in November, 1958, using materials from the old gravel road and 6.5% cement. Core-tested in July of 1959, it registered 560 psi.

Pavement strength up 15% in 8 months on this Hall County, Nebraska, road

...soil-cement pavement grows stronger year by year!

Core tests show soil-cement gains strength from the first day it's laid . . . and keeps gaining in strength month after month!

Inch for inch, soil-cement is the strongest low-cost pavement. It provides beam strength that spreads traffic loads over the subgrade. It stays level and unrutted yet its initial cost is really low.

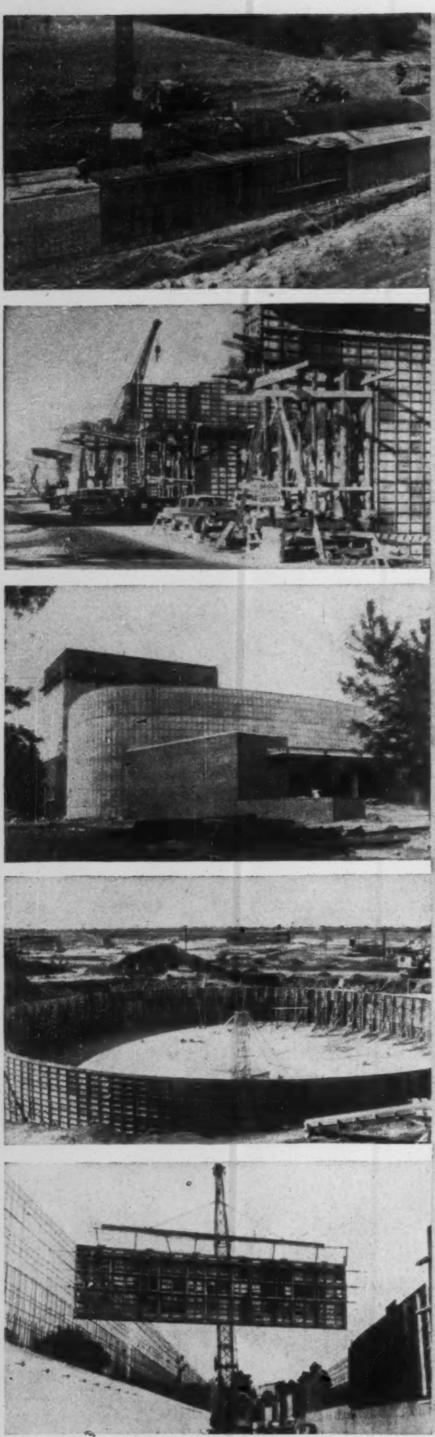
In fact, 75% of the materials are usually free. Soil, old gravel roads, or broken-up blacktop, can be the main ingredients. Just mix them with portland cement and water—roll solid, let harden, then top with a thin bituminous surface. Experienced crews using modern machines can lay up to two miles a day. And this is low-maintenance-cost pavement—it stretches road budgets, lets engineers plan ahead.

Soil-cement is the fastest-growing low-cost pavement for roads, streets, shoulders, subbases, airports and parking lots.

PORTLAND CEMENT ASSOCIATION

A national organization to improve and extend the uses of portland cement and concrete

25 YEARS SOIL-CEMENT 1935-1960



CONCRETE FORMING PROBLEMS

PROFITABLY SOLVED

BY RENTING **UNI-FORM PANELS**

Over the years thousands of contractors have rented UNI-FORM Panels to form concrete and save money on almost every conceivable type of job, from house foundations to mammoth industrial projects. Renting UNI-FORM Panels is simple . . . You send us a set of plans and we will send you a rental proposal based on what you would need. You will get a tailor-made forming system delivered to your job. But the big advantage is that you will be able to use a forming system that will out-perform any other method you might use. Write today for the complete story on UNI-FORM Panels or send us a set of plans; either way we will be glad to hear from you.

UNIVERSAL FORM CLAMP CO.

"Products from the Gold Tool Room"

1238 N. KOSTNER AVENUE · CHICAGO 51, ILLINOIS

BRANCH OFFICES and WAREHOUSES:

ATLANTA BALTIMORE CLEVELAND HOUSTON
LOS ANGELES SAN LEANDRO TORONTO

Clipper®

SuperMatic (314)

can save you 32.7% on blade costs alone

Clipper
SUPERMATIC 314

The proper speed for a 20" blade is not the proper speed for a 14" blade. Clipper 14" Supermatic 314 Hi-Speed Masonry Saw gives you 32.7% longer blade life using a 14" blade, than you get when you use the same blade on a universal 14"-20" saw. Independent laboratory tests verify these figures.

On a Supermatic 14", an operator can line up his cuts much faster than he can with a 20" saw without sacrificing cutting speed.

True, certain jobs call for capacity beyond 14" . . . for instance, a large block job where it is important to be able to cut in a single pass. For these jobs, Clipper offers you its famous Supermatic 300. But, **don't be misled!** If a 14" saw meets your requirements, and it meets the requirements of most saw owners, you can get 32.7% longer life out of your blades by choosing a Hi-Speed Clipper SM 314.

Only Clipper Offers You This Choice! That's why only Clipper can offer you the right saw no matter what your cutting requirements are. Buy from Clipper, the world's recognized leader in masonry and concrete cutting equipment. Call Collect Today For Free Trial On Your Job.

MR. CLIPPER

Clipper®

MANUFACTURING COMPANY

General Offices and Factory:
2812 Warwick, GRand 1-0766, Kansas City 8, Mo.
Sold Direct from Offices and Warehouses Coast to Coast
Factories in England—France—Germany—Italy
Ask About Clipper's Liberal TRADE-IN OFFER NOW IN EFFECT . . .
Write, wire or call collect now for full details

252X

Make more profit on the jobs ahead with.

SYMONS® CONE CRUSHERS

FOR VOLUME PRODUCTION OF QUALITY AGGREGATE

These dramatic views of sections of the important new Illinois Tollway system serve as an outstanding example of the vast contributions to the progress of mankind being made by the construction industry. In huge construction projects such as this, specification aggregate has assumed an increasingly important role. To meet the constantly growing demand for vast tonnages of quality aggregate used in concrete and bituminous highways, Symons Cone Crushers are today, more so than ever before, the first choice of leading producers throughout the world. Symons Cone Crushers are also used in sand preparation operations.

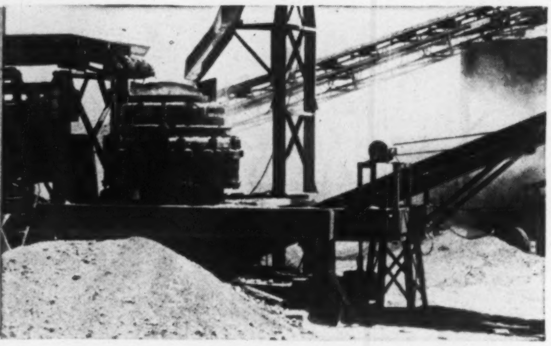
For in aggregate and sand production . . . *as in all of the great ore and industrial minerals operations the world over* . . . no record equals the performance of Symons Cone Crushers that have so consistently produced, economically and efficiently, great quantities of finely crushed product resulting in higher profit per ton per hour.

Before you submit *your* next bid, get full information about Symons Crushers.

SYMONS . . . a registered Nordberg trademark known throughout the world

FOR STATIONARY PLANTS

Symons Cone Crushers, in Standard and Short Head types, are the choice of leading contractors and producers for primary, secondary and finer reductions in all types of aggregate operations. Available in sizes from 22″ to 7′ in diameter, for capacities from 6 to 900 or more tons per hour.



FOR PORTABLE PLANTS

Symons Cone Crushers are being used in increasing numbers for portable and semi-portable crushing plants. View shows part of a Cedarapids portable crushing and screening plant, utilizing a Symons Cone Crusher. Unit is serving a large Texas aggregate producer.

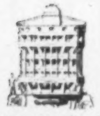
CIRCLE 23 ON READER SERVICE CARD

C-160

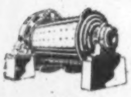
ILLINOIS
TOLLWAY

(ABOVE:) Tri-level interchange of Northwest and Tri-State Tollways near Chicago's O'Hare International Airport.

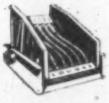
(RIGHT:) View of the modern Northwest Tollway bridge crossing the Fox River near Elgin, Illinois.



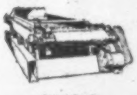
SYMONS PRIMARY GYRATORY CRUSHERS



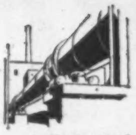
NORDBERG GRINDING MILLS



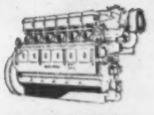
SYMONS VIBRATING GRIZZLIES



SYMONS VIBRATING SCREENS



ROTARY KILNS AND DRYERS



NORDBERG ENGINES

NORDBERG MANUFACTURING COMPANY • Milwaukee 1, Wisconsin

ATLANTA • CLEVELAND • DALLAS • DULUTH • HOUSTON • KANSAS CITY • MINNEAPOLIS • NEW ORLEANS • NEW YORK • ST. LOUIS
SAN FRANCISCO • TAMPA • WASHINGTON • TORONTO • VANCOUVER • JOHANNESBURG • LONDON • MEXICO, D.F.

SYMONS
SCREENS
NORDBERG

© 1960, N.M.CO.

"Shear-Ball" connection eliminates adjustments, boosts output

In this unique design a single row of balls holds turntable to mounting — allows it to revolve smoothly, freely, steadily, year after year. There are no center pins, center pin nuts, centering gudgeons, rollers, bushings, exposed roller paths to be lubricated and adjusted frequently. Even in constant rock digging there is no bounce or wobble.

10-year warranty. "Shear-Ball®" has proven so reliable in ten years of field use on many hundreds of machines that Lorain now warrants the "Shear-Ball" for 10 years against failure to function in normal use and service.

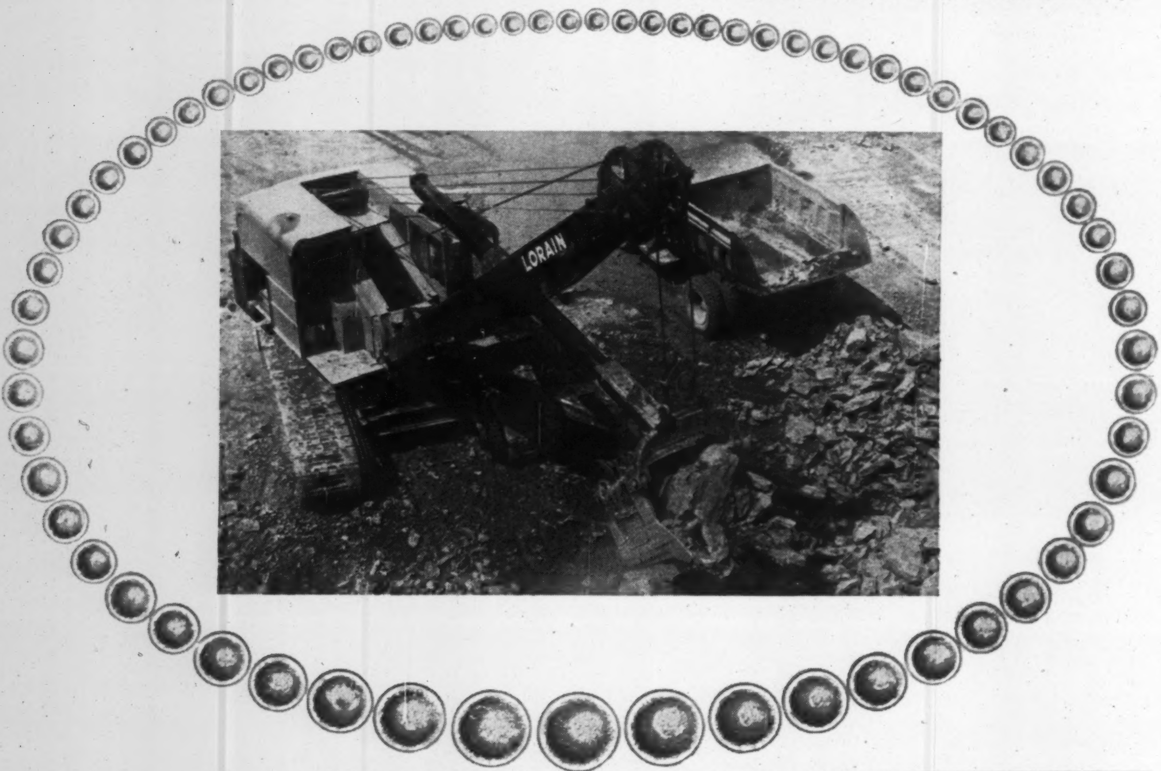
Contractors report: "During two years of operation we never touched 'Shear-Ball' mountings except to lubricate them. Yet our other hook roller and center-pin types have been in the shop for new rollers, bushings and pins."

"As far as maintenance is concerned, there is no comparison between 'Shear-Ball' and any other type of mountings . . . before 'Shear-Ball' we spent $7,000 to $8,000 for rollers, bushings and cracked frames."

"The single ball race design gives us a more compact machine to get under lower bridges."

You too can have this kind of performance. See your Lorain shovel and crane distributor or write direct and ask for the "Shear-Ball" booklet that gives a full explanation of this unique feature.

THE THEW SHOVEL COMPANY, LORAIN, OHIO



LORAIN® ON THE MOVE

PLANTS: In Lorain, Elyria and Bucyrus, Ohio . . . **PRODUCTS:** Power shovels, draglines, clamshell, and hoes from ⅜-yard to 2½-yard capacity • Cranes from 7 to 80 tons . . . on crawlers, and as rubber-tire Moto-Cranes, and Self-Propelled Cranes • Rubber tire front-end Moto-Loaders in 6000-lb. and 7000-lb. carrying capacity . . . **OUTLETS:** Lorain products are sold and serviced by 249 distributor outlets throughout the world.

Take a giant step to fast, low-cost surveying with

ELECTROTAPE

(FORMERLY MICRO-DIST)

precision electronic surveying equipment

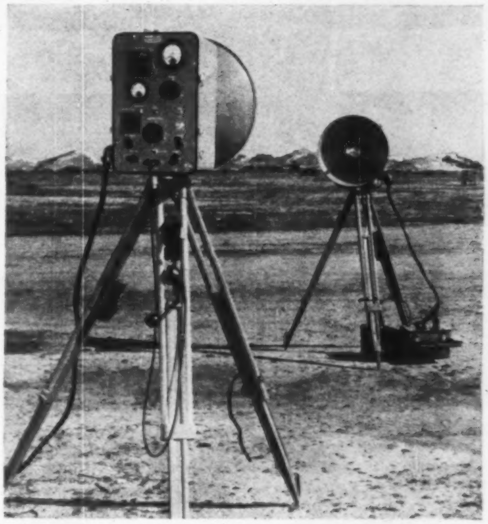
FAST: Weeks of surveying completed in a few hours. Time-saving features include illuminated direct digital readout which minimizes the danger of costly operator error through misinterpretation . . . speeds up conversion of electronic measurement to linear distance and makes the total measuring operation faster, easier. Crystal calibration and crystal synchronization are automatic. Transistorization makes warm-up time negligible.

FIELD-PROVED Electrotape, lightweight and portable, provides surveying accuracy of 3 p.p.m. ± 1 inch over ranges from 250 feet to 50 miles. Operating on an interrogator-responder electronic principle, either of the interchangeable stations can serve as master or slave, a feature which makes the Electrotape system faster and more flexible.

ALL-WEATHER OPERATION is possible through wide temperature range capabilities, water-sealed cases and illuminated panel. Unhampered by bad weather, unfavorable climate, darkness . . . you get the job done. A regulated power supply minimizes the danger of unexpected battery run-down.

OTHER FEATURES include headsets for the built-in two-way radio link, freeing the operator's hands; standard plug-in circuit design for ease of routine maintenance; rugged construction for dependable field use; advanced electronic design for unparalleled reliability. American electronic know-how assures operational dependability.

TO SAVE TIME, TO SAVE MONEY: ELECTROTAPE



cubic
CORPORATION

CUBIC CORPORATION
5575 Kearny Villa Rd., San Diego 11, Calif., Dept. ENR-1

Please send complete information on ELECTROTAPE:

NAME____________________

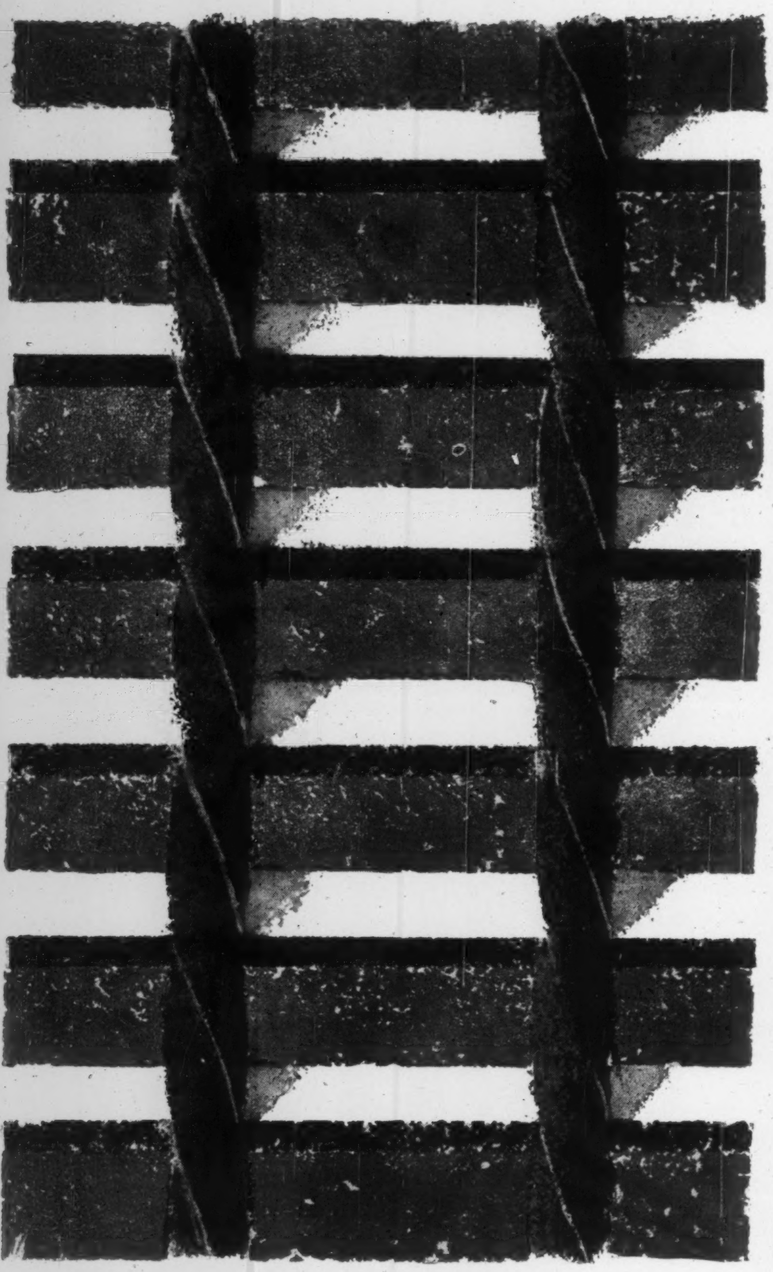
TITLE____________________

ORGANIZATION____________________

ADDRESS____________________

CITY__________ZONE______STATE______

CIRCLE 25 ON READER SERVICE CARD



Blaw-Knox Electroforged Grating solves so many problems for so many industries. Catalog free on request. Write Blaw-Knox Equipment Division, Pittsburgh 38, Pennsylvania.

BLAW-KNOX
GRATING

Horse Dam. Hungry Horse being the fourth largest in the world at that time, and those ranking ahead of it—Grand Coulee, Shasta and Hoover—all being U.S.B.R. dams, it seemed only natural for him to compare their concrete-placement records.

Actually, concrete placement on the second stage at Grand Coulee went so fast that the cement mills had a hard time keeping the pace. Suppliers delivered up to 365,000 bbl per month —45,000 bbl over the amount called for in the cement contract—and Consolidated Builders, Inc., operators of the concrete mixing plant, could have used as much as 450,000 bbl per month. The contractor had two concrete plants each with four 4-cu-yd mixers working.

Incidentally, when the May 25, 1939 record was made, it was believed that the previous record pour was on the first stage at Grand Coulee by MWAK, which had placed 15,844 cu yd in a 24-hour day in 1937.

The Fontana Dam 11,419-cu-yd day was recorded using concrete mixed in a single plant consisting of five 4-cu-yd mixers.

Top Firm Overlooked

Sir—We were rather surprised to find that we were not included in the list of "Top Contractors for 1959" in your July 28, 1960 issue.

For the year 1959, we actually received contracts in the amount of $55,470,000, and as of August 15, 1960, our backlog amounts to $265 million, which includes the Grand Central City project of $100 million.

In addition, we are consultant contractors on $78 million worth of work outside of metropolitan New York.

We think this total is quite creditable and would have looked good among the "Top Contractors for 1959."

C. A. Morse
President
Diesel Construction Co., Inc.
New York, N. Y.

Editor's Note: The $55,470,000 of contracts received in 1959 certainly entitles Diesel Construction Co. to be included among the "Top Contractors" of that year. The company was inadvertently omitted because the total that had been reported to ENR was less than $25 million—the minimum for listing. The company's $100 million Grand Central City contract was included in the figures for 1958, a year when Diesel Construction Co. was in third place.

Credit Due

In the article on Abilene Junior High School (ENR Aug. 11, p. 32), credit for the electrical and mechanical consulting engineer was inadvertently omitted It should go to Tippet & Gee, Abilene, Tex.

(Reader Comment continued p. 32)

THERE'S A WORLD OF "CAN DO"

in the MASSEY-FERGUSON 1001 Tractor Shovel

NEW M-F FORK LIFT HAS INSTANT REVERSE

The 204 Fork Lift is another "MUST HAVE" in the Massey-Ferguson Industrial Line. The way the big 5,000-lb. capacity 204 "slides" into a load would warm any operator's heart. And it will go anywhere a tractor will go — smooth surfaces or rough — muddy areas. Instant Reverse gives the fastest smoothest operation you've ever seen! A wide range of attachments is available for marvelous versatility.

featuring INSTANT REVERSE

Here's a capsule description of the M-F 1001 — **powerful and rugged yet agile and fast.** Compare its price, performance, and quality-wise (and anywise for that matter) with the rest of the field! "HAVE DONE" performance has proven that the M-F 1001 —

CAN get you there and back while others are still on the way.

CAN out-perform larger, more expensive single-purpose machines on the big jobs.

CAN handle smaller, precision jobs with economy and dispatch.

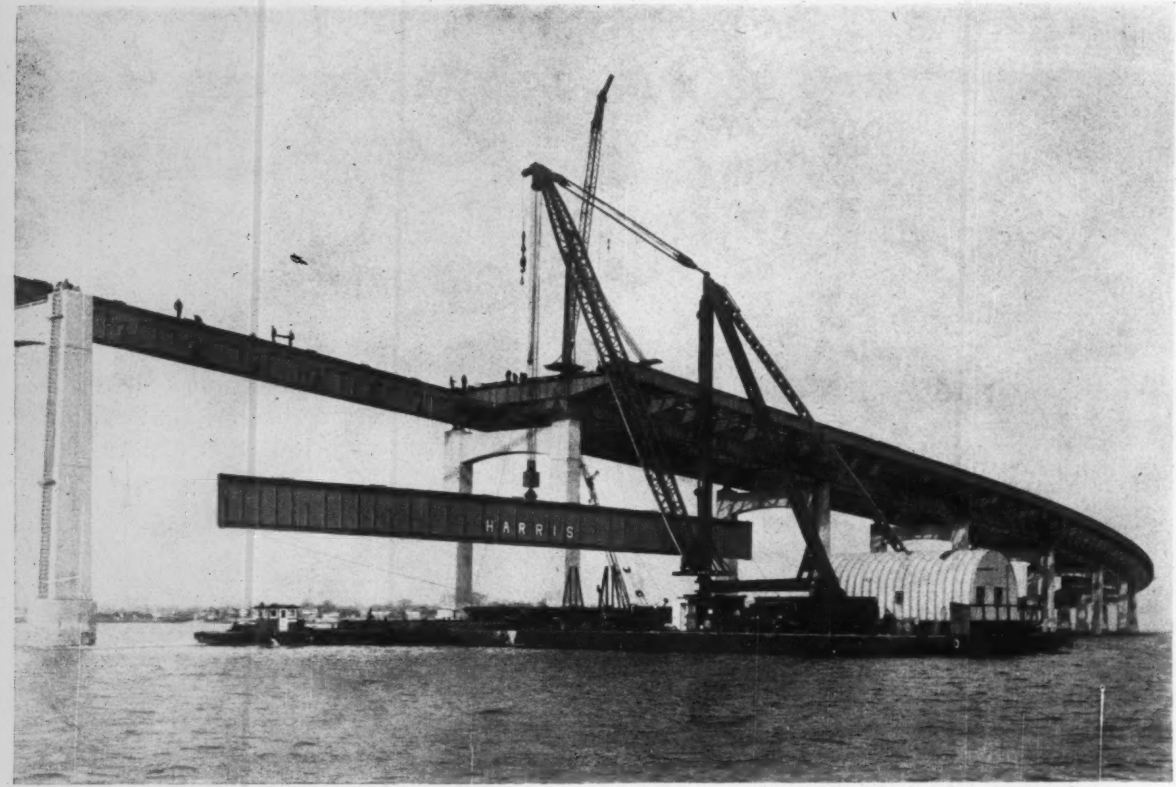
CAN provide low-cost versatility because of numerous attachments.

The M-F 1001 gets big, heaped loads because of low-pivoted bull dozer action, tremendous pryout capacity, and extremely effective rollback angle. And it gets them fast because of "touch-of-the-toe" INSTANT REVERSE. No other tractor shovel in its class can boast of such maneuverability.

Why Wait? — Set a Date — We'll Demonstrate!

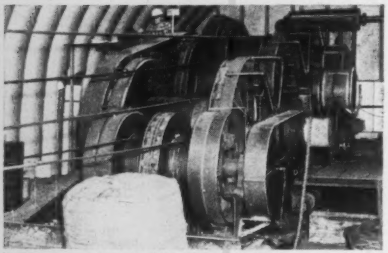
MASSEY-FERGUSON INDUSTRIAL DIVISION
Block 1000 South West St., Wichita 13, Kansas
Producing Sizeable Power for the "Sensational 60's"

MF 60-26



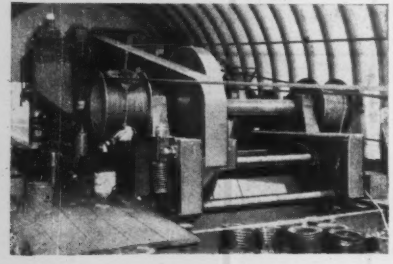
A 42,000 line pull Clyde Hoist handles a 125 ton pick for Harris Structural Steel Co., Inc., on the Bronx approach of Throgs Neck Bridge. A second Frame-12 Clyde Hoist operates traveler derrick for lifts on higher piers.

HARRIS BUILDS BRONX APPROACH OF THROGS NECK BRIDGE WITH CLYDE



Barge mounted Clyde Hoist equipped with pony drums for vang line slewing.

Clyde hoist and swinger operating traveler derrick.



MEN AND MACHINES combine to accomplish difficult construction to serve man's needs. But it takes highly skilled and experienced manpower and specialized and dependable machines! Harris' use of two Clyde Frame-12 Hoists for the erection of the Bronx approach provided just such an effective combination!

CLYDE'S 'PLUS' FEATURES are many and varied. Two outstanding features that assure fast, safe spotting are Clyde's large diameter brakes and internal expanding band friction clutches. Both are extremely smooth in engagement and release . . . both are Clyde advantages born of over 60 years of experience in building the finest hoists made. Clyde Hoists have all steel bed and side frames, high strength spur gears, over-size anti-friction bearings . . . but why go on? The money-making, money-saving features of Clyde Hoists are endless. Why not write for Bulletin 34 and study the specs on Clyde's complete line of Hoists? There is no obligation.

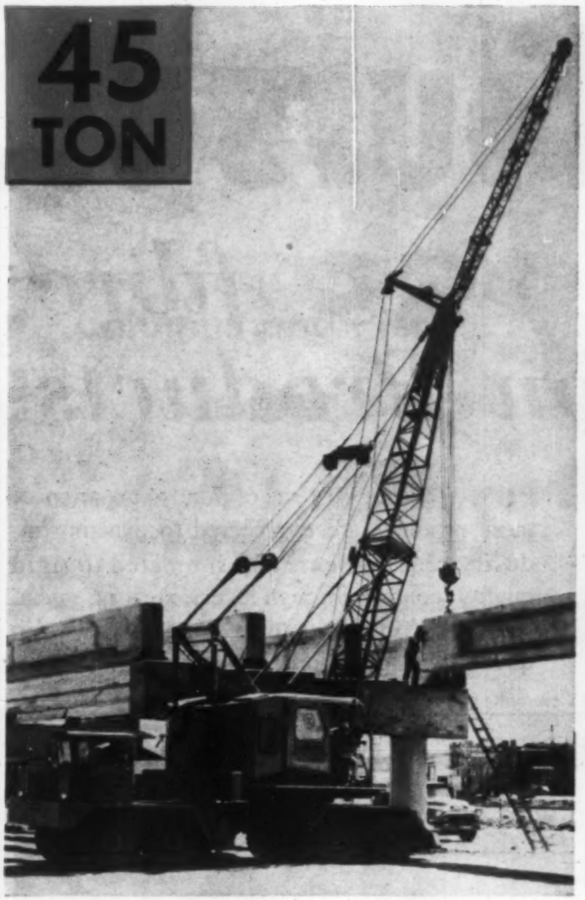
"Quality is Always Foremost in Clyde Hoists"

CLYDE

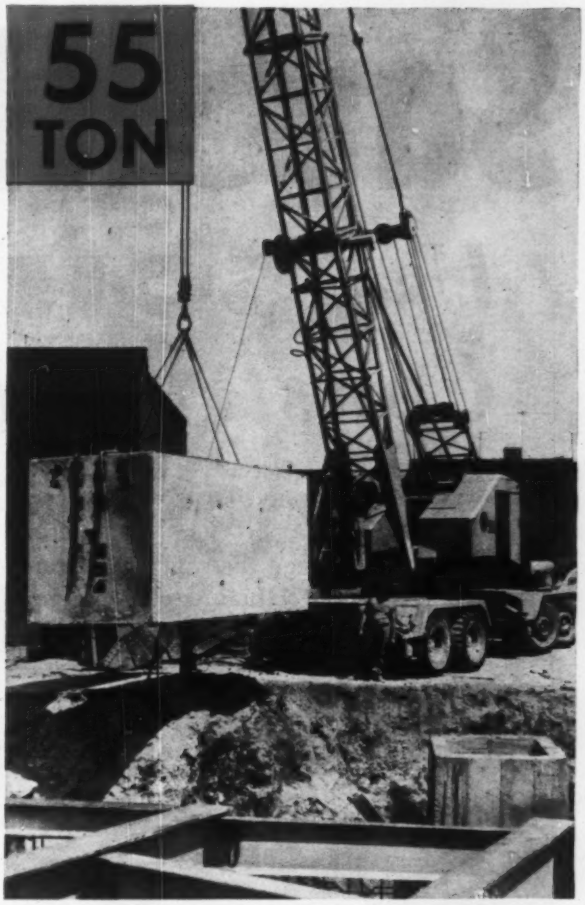
CLYDE IRON WORKS, Inc.
Established 1899
DULUTH 1, MINNESOTA

A SUBSIDIARY OF RIC REPUBLIC INDUSTRIAL CORPORATION

HOISTS : DERRICKS : WHIRLEYS : BUILDERS TOWERS
UNLOADERS : CAR PULLERS : ROLLERS



Koehring 445 walks precast bridge member into place on Colorado highway job.



Koehring 555 on Long Island expressway contract sets heavy concrete manhole.

UNDER LOAD OR ON THE ROAD
NOTHING HANDLES LIKE A KOEHRING

Koehring heavy-duty truck cranes give you the mobility and stability to get toughest lifting assignments finished quickly. Mounted on rugged 4-axle truck, they convert quickly from fully equipped crane to roadable machine for traveling. Counter-weight, boom, and outriggers can be easily removed to reduce machine weight to meet road limits.

You get extra work capacity for safe, sure lifting and spotting. Booms have combination pin-pad connections . . . combine safety of bolted connections with quick-change advantages of pin connections.

For complete information, get in touch with your local Koehring distributor or write to us for catalogs . . . do it soon.

K34

MORE WORK CAPACITY...
MORE PROFIT PER DOLLAR INVESTED

See your distributor about Koehring Equipment Show
Waukesha, Wis., Week of Sept. 19th.

KOEHRING
DIVISION OF KOEHRING COMPANY
Milwaukee 16, Wisconsin

CIRCLE 29 ON READER SERVICE CARD

Save Hours ...

Use SONOCO *fibre Construction Products*

Sonoco Fibre Construction Products speed construction, save labor, conserve materials, and permit new design and structural features. They have proved valuable to contractors, architects, engineers, and owners everywhere as evidenced by their widespread use.

Backed by over 60 years of Sonoco experience, these products are engineered to exacting industry requirements and subjected to rigid quality control through every step of manufacture. You are assured of uniformly high quality with every order.

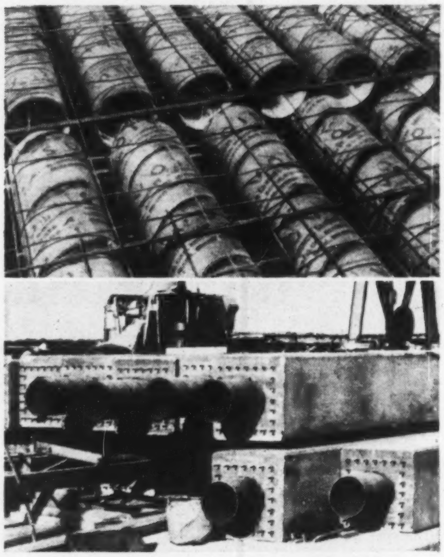
VOIDS in Concrete Slabs and Piles Save Materials and Money

Form voids in concrete construction with

SONOCO

SONOVOID®

FIBRE TUBES



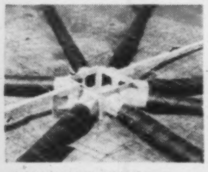
In concrete slabs, decks, and precast piles, voids formed with Sonovoid Fibre Tubes displace low-working concrete . . . thus reducing weight as well as the amount of concrete and reinforcing steel required. This load reduction means additional savings on foundations and supporting members, permits the design of longer span slabs, and makes precast piles easier to handle and drive.

Sonoco Sonovoid Fibre Tubes are *designed* to form voids in concrete construction. They are low in cost, lightweight and easily handled, and save both contractors and owners time, labor, materials, and money.

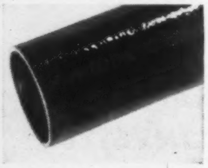
Order Sonovoid Fibre Tubes in sizes from 2.25" to 36.9" O. D.—standard 18' lengths or as required. Can be sawed—end closures available.

Other **SONOCO** Fibre Construction Products

DUROPIPE Bituminized Fibre Pipe—regular or perforated

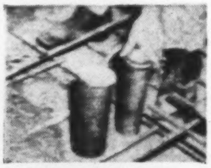


SONOAIRDUCT Fibre Duct for slab perimeter heating



P.I. PIPE—pitch-impregnated pipe in sizes to 36" I.D.

SONOMOLD Fibre Molds for concrete test cylinders

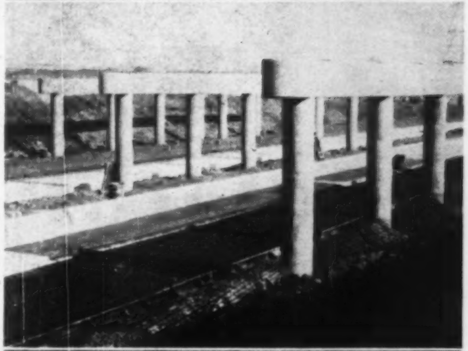


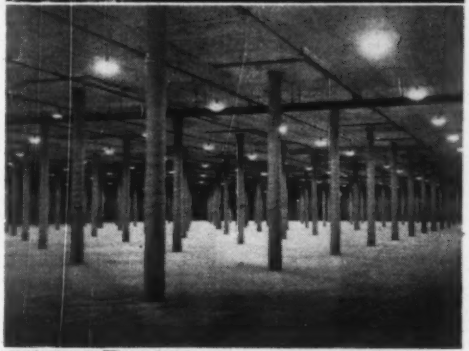
SONOPIPE SLEEVES

Save Dollars!

Reduce Costs of Round Concrete Columns and Piers . . . with

SONOCO Sonotube® FIBRE FORMS





In bridges, overpasses, buildings, or any structure, SONOTUBE Fibre Forms speed construction and reduce costs . . . by forming round concrete piers and columns faster and more economically than any other method.

With their light weight, SONOTUBE Fibre Forms handle easier and are quickly placed, braced, poured and stripped . . . thus saving contractors time, labor, and money. Versatile too, these forms can be sawed for tie-in with other forms and punched for anchor bolts and dowel rods or cut for utility outlets.

Use Sonoco SONOTUBE Fibre Forms wherever round concrete columns are specified—choose the type that meets your job requirements most economically:

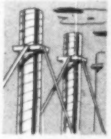
1. **"A" Coated** (patented)—standard form for exposed columns; permits painting or plastering of stripped column.
2. **Seamless** (pat. pend.)—premium form for finished columns; produces a smooth, continuous concrete surface.
3. **"W" Coated**—wax coated form for columns where stripping is not necessary or finishing not required.
4. **Encasement Form**—to encase existing columns, piling, posts, and utility lines with concrete.
5. **Special**—forms for use in water or excessively damp places are available on special order.

Order SONOTUBE Fibre Forms in sizes from 2" to 48" I. D., in specified lengths or standard 18' lengths. Can be sawed at the job.

Lightweight and easy to handle

Can be sawed to size on the job

Place by conventional means



Only minimum bracing is required

Pour by normal method at normal rate

Stripping is easy and quick

SEE OUR CATALOG IN SWEET'S

For full information and prices, write

SONOCO

Construction Products

SONOCO PRODUCTS COMPANY

SONOCO PRODUCTS COMPANY, HARTSVILLE, S. C. • La Puente, Calif. • Fremont, Calif. • Montclair, N. J. • Akron, Indiana • Longview, Texas • Atlanta, Ga. • Brantford, Ont. • Mexico, D. F.

5137

OWEN BUCKETS

THE GIANT OF THEM ALL

The following five combined features make OWEN the big giant performer . . . for any type of clamshell work . . . for any model or make of crane.

1. Block and Tackle Type Reeving
2. One-Piece Head Construction
3. Riveted Bowl Assembly
4. Single Main Shaft
5. Recessed Lips

Added to these construction features are more than fifty years experience in the manufacturing of clamshells . . . and nothing else! For any job that requires a clamshell, there is an Owen to fill the bill . . . backed by proven construction design and over one-half century of experience.

Put the Giant on your crane — OWEN — and know the work will be done faster, better and more economically.

Write today for any specific or additional information

The OWEN BUCKET Co.
BREAKWATER AVENUE, CLEVELAND 2, OHIO
BRANCHES: New York • Philadelphia • Chicago
Berkeley, Calif. • Fort Lauderdale, Fla.

Changed Pile Equation

SIR—Some time ago you published an article written by me entitled "What Happens When Hammer Hits Pile" (ENR Sept. 5, 1957, p. 46).

I retired from Raymond International last January, but before doing so I prepared for the ASCE a complete and formal paper on the same subject, entitled "Pile Driving Analysis by the Wave Equation." I have been advised that this paper is listed as #2574 and that it will be published in this month's edition of the Soil Mechanics Division Proceedings.

The article "What Happens When Hammer Hits Pile" is not referred to in the ASCE paper because in some ways it is now out of date and I wished to avoid confusion. In particular, we have found it necessary to take account of the resistance caused by the velocity with which the pile forces its way through the ground. This resistance due to velocity is instantaneous and does not contribute to the bearing capacity of the pile. The inclusion of this velocity effect was suggested by Mr. W. P. Kinneman, Chief Civil Engineer of Raymond International. Its inclusion results in a lowering of the indicated ultimate bearing capacity of the pile as compared with that shown in the article that was published in your magazine.

EDWARD A. SMITH
Tucson, Arizona

Rah, Harvard

SIR—Our congratulations and highest esteem go to the architect who has succeeded in livening up the facade of a new school building with a nonmodular distribution of windows (ENR Aug. 18, p. 34).

What a relief this treatment presents from the usual monotonous array of predominantly vertical or horizontal strip and honeycomb fenestration pattern with which we are obsessed in modern buildings.

This is the first attempt that we know of to date at breaking up the crushing uniformity which has existed in building facades.

Is it possible to know the name of the architect responsible for this courageous innovation?

We should like to see more of this aesthetic boldness. Heaven only knows that modern architecture is sorely in need of it.

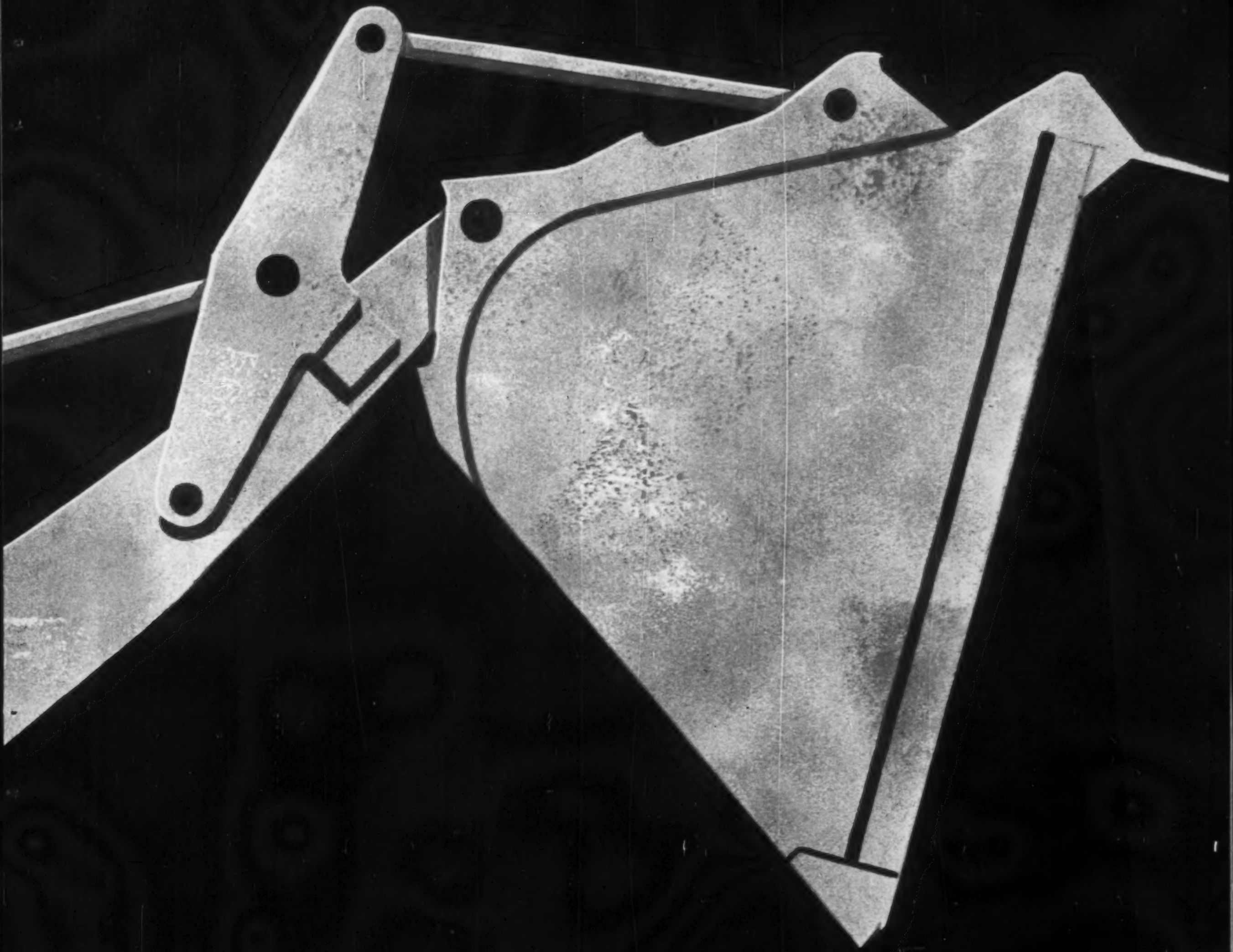
HENRY VAUGLE

Editor's Note: The building referred to is the Quincy House addition at Harvard University, Cambridge, Mass. The architect was Shepley, Bulfinch, Richardson & Abbott of Boston (ENR Aug. 18, p. 60).

(*Reader Comment continued p. 37*)

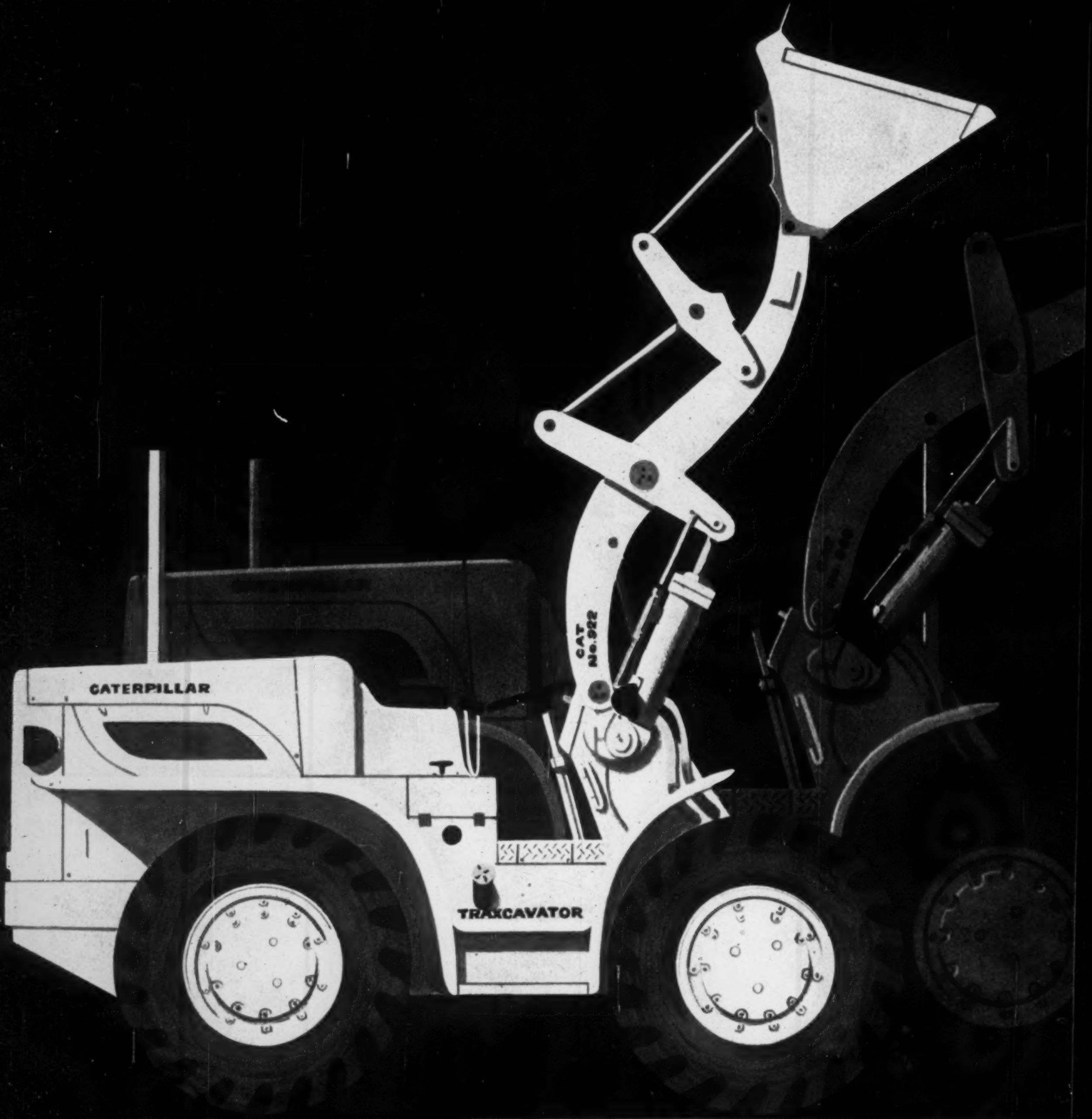
BRAND NEW...WITH 7 YEARS' PROOF!

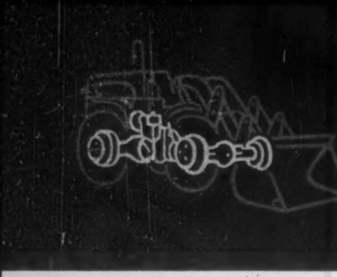
THE GREAT NEW LINE OF CATERPILLAR WHEEL LOADERS

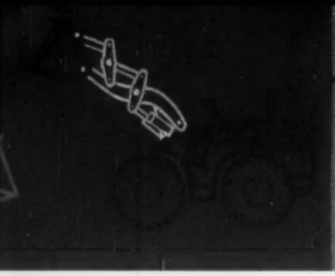


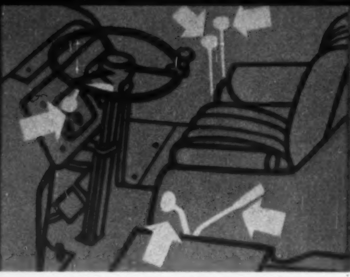
THE NEW 966...2 3/4 YD., [illegible]

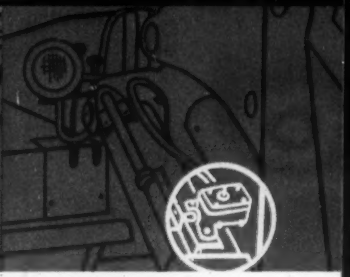
THE NEW 922...1 1/4 YD., [illegible]











Power Shift Transmission. It's Cat-built . . . gives smooth, instant shifting for 1st-2nd speeds . . . forward and reverse. In high-speed travel range, the machine is in 2-wheel drive. A shift to work range puts power to all four wheels for full traction when it is needed.

Operator Safety. Lift arms and cylinders are all forward of the cockpit . . . giving complete freedom of movement. Visibility is excellent at all times. It's easy and safe to get into a Traxcavator from either side . . . up three wide steps. Tires are shielded by fenders.

Operator Convenience. Bucket controls are on the right side, leaving the left hand free for machine operation. The forward-reverse lever is mounted on the steering column for finger-tip shifting without decelerating; 1st and 2nd, high-low range levers placed at left of seat.

Automatic Bucket Positioner. With bucket loaded, lift lever is put in up position. The bucket goes up to dumping height and the control kicks into hold position automatically. While lowering after dumping, a pull on the tilt lever automatically positions bucket for digging.

There's a long history of extensive testing and development behind these new machines. They've been thoroughly proven in a long research program. And you're getting the full benefit of Caterpillar's 23 years of loader leadership . . . 20 years of wheel-tractor building.

All three wheel loaders have been tested, strained, tortured . . . with a field force of Caterpillar engineers watching every move . . . around the clock. After final refinements, these machines went out on customer jobs all over the country. They proved themselves with an unmatched combination of speed, operator safety and convenience, high production and traditional Caterpillar dependability. They're ready now . . . with no compromises.

THE 922 TRAXCAVATOR—1¼ CU. YD. BUCKET

Proven on the jump-and-run jobs

• 80 HP. Choice of compact 4-cylinder Cat turbocharged Diesel Engine (uses low-cost furnace oil) or 6-cylinder gasoline engine with big displacement for long life and sustained power. With either engine you have one source of warranty . . . one source of parts and service . . . your Caterpillar Dealer. • Long 41″ reach at 7′ dumping height . . . maximum lift of 11′ 2″.

PROVEN IN 7 YEARS OF TESTS...THE NEW 922 AND 966

THE 966 TRAXCAVATOR—2¾ CU. YD. STANDARD BUCKET

Proven on jobs where time is measured in tons of material loaded

• 140 HP from the Caterpillar D333 Diesel Engine, turbocharged for extra efficiency and quick acceleration in machine drive and bucket hydraulics. • 57″ reach at 7′ dumping height with a maximum lift of 12′ 10¼″. • LIVE ACTION HYDRAULICS for tough material excavation, fast lift and dump. • DUAL-RATIO STEERING for work and highway travel. Gives operator easy, quick turns for fast maneuvering on work cycles, safe automotive-type steering for high-speed traveling.

BOTH THE 922 AND 966 HAVE ALL THESE PROVEN FEATURES, INTRODUCED BY THE POPULAR 944 TRAXCAVATOR

Dual Brakes. The left brake neutralizes the transmission as it stops the machine. This transfers extra power to the bucket . . . assuring full loads even in tough material. The right brake stops the machine with the transmission engaged . . . giving full machine control.

Easy Service Access. The seat tips forward for easy access to transmission oil filter and control linkage adjustments. Unit construction allows independent removal of engine, transmission, other major components. The dry-type air cleaner can be serviced in about 5 minutes.

Live Action Hydraulic System. Plenty of power from the engine is always available to the hydraulic system for fast bucket action. Control valves are enclosed in the steel reservoir for complete protection. The Caterpillar Live Action Hydraulic System is full-flow filtered for trouble-free operation.

Available with a Complete Line of Attachments. There are special buckets for light or heavy materials, forks and the exclusive Side Dump Bucket that cuts maneuvering time and space because it dumps to the left as well as forward. A fiber-glass cab is also available.

- Herff and Fred Harris, owners of the Harris Sand Pit, Von Ormy, Texas, bought a 944 in April and another in June. The first machine was put to work 12 hours a day, 6 days a week. In June its service meter read 740 hours. "We haven't had a minute's down time," said Herff Harris. "This machine's been working! We like everything about it and especially the basic design that gets the lift arms out of the operators' hair. We figure the speed of the machine plus the automatic bucket positioners give us at least 25% more production than other machines of the same size."

REPORTS

FROM THE FIELD:

HERE'S WHY THE 944 HAS GAINED ACCEPTANCE UNMATCHED IN MACHINE HISTORY

- At the Clarksville Stone Co. near Clarksville, Tenn., Charles Day speaks his views of their 944: "I believe this new Traxcavator is the best machine in its class and for several reasons. One is that open, clean deck; our operators are on and off the machine a good deal and on the 944 they can just walk up, sit down and go to work. And I've noticed the stability of the machine is better than the rest; the 944 doesn't tip—it stays on the ground. I've heard our operators talk enthusiastically about the easy controls and especially the automatic bucket positioners. Our best operators are better on the 944."

If there's a 944 operating in your area, chances are you'll get this kind of impressive report from owner and operator. But for the whole story on all 3 wheel loaders, there's only one man to see—YOUR CATERPILLAR DEALER. His staff of materials handling experts and heavy equipment specialists has the full story on the wheel loader line that's brand new with features, but 7 years old with experience. Ask for a demonstration on your job ... see how these wheel Traxcavators make other loaders obsolete.

Caterpillar Tractor Co., General Offices, Peoria, Illinois, U.S.A.

CATERPILLAR

Caterpillar, Cat and Traxcavator are Registered Trademarks of Caterpillar Tractor Co.

ADVANCED AS TOMORROW
CERTAIN AS YESTERDAY

Professional 'Packages'

SIR—Your editorial "Professional Soul Searching" (ENR June 30, p. 68) was extremely interesting to me. We have recently set up a corporation which will cope with the problem of turnkey operations from a professional viewpoint in precisely the method outlined by your editorial. Northeast Construction Managers, Inc., in conjunction with Karl J. Bea Associates Engineers, now offer an integrated service on a fee basis.

KARL J. BEA
Pulaski, N. Y.

Balanced Tower of Pisa?

SIR—Concerning the Leaning Tower of Pisa problem (ENR July 28, p. 15): I have no factual information, but here is a wild idea that may have been considered already and discarded: How about a "counterweight" at ground level, attached to the Tower—tending to tip the Tower back toward the vertical?

RICHARD E. WEBER
Schenectady, N.Y.

For your calendar . . .

American Welding Society, fall meeting, Penn-Sheraton Hotel, Pittsburgh, Pa., Sept. 26-29. Write: American Welding Society, 33 W. 39th St., New York 18.

Prestressed Concrete Institute, annual convention, Hotel Statler Hilton, New York City, Sept. 27-30. Write: P. Stauffer, 131 Cedar St., New York 6, N. Y.

Water Pollution Control Federation, annual meeting, Convention Hall, Philadelphia, Pa., Oct. 2-6. Write: Ralph E. Fuhrman, 4435 Wisconsin Ave., N. W., Washington 16, D. C.

American Society of Civil Engineers, annual meeting, Hotel Statler Hilton, Boston, Oct. 10-14. Write: E. S. Kirkpatrick, American Society of Civil Engineers, 33 W. 39th St., New York, N. Y.

American Society for Metals, 42nd National Metal Exposition & Congress, Trade and Convention Center, Philadelphia, Pa., Oct. 17-21. Write: Chester L. Wells, Exposition Manager, American Society for Metals, 7301 Euclid Ave., Cleveland 3, Ohio.

National Safety Council, annual congress, Conrad Hilton Hotel, Chicago, Ill., Oct. 17-21. Write: Sid Cato, 425 N. Michigan Ave., Chicago 11, Ill.

American Institute of Steel Construction, annual convention, Hotel Greenbrier, White Sulphur Springs, W. Va. Write: L. Abbet Post, 101 Park Ave., New York 17, N. Y.

American Public Health Association, annual meeting, San Francisco, Calif., Oct. 31-Nov. 4. Write Schless & Co., 59 E. 54th St., New York 22, N. Y.

Building Research Institute, fall conference, Shoreham Hotel, Washington, D. C., Nov. 15-17. Write: Harold Horowitz, 2101 Constitution Ave., Washington 25, D. C.

Industrial Building Exposition & Congress, New York Coliseum, Dec. 12-15. Write: Clapp & Poliak, 341 Madison Ave., New York, N. Y.

Atomic Industrial Forum & American Nuclear Society, Atomic Industry Exhibitions, California Masonic Temple, San Francisco, Dec. 12-15. Write: Atomic Industrial Forum, 3 E. 54th St., New York 22, N. Y.

Fall . . .

now is the time to properly light your construction hazards

USE THE DIETZ 3 WAY HAZARD WARNING SYSTEM

LANTERNS TORCHES VISI-FLASH

Use Dietz Visi-Flash Lights to alert the oncoming driver. Brightest, safest, most trouble-free flashers on the market. Warn: "Danger Ahead" for up to 1500 hours without changing batteries.

Use Dietz Lanterns to locate hazard in relation to driver's position. Show exact location, shape, extent, and boundaries of hazard area. Burn up to 100 hours.

Use Dietz Torches to guide driver around the hazard. Fully illuminate the danger in every weather. Burn up to 48 hours on low cost kerosene.

It's Fall . . . shorter days . . . still lots of traffic!

Proper lighting of the highway hazard is an essential investment to protect the public, workers, and equipment, and to eliminate potential causes of costly lawsuits.

NEW! DIETZ HAZARD WARNING PLANNER

A Practical On-the-Job Tool! Quickly and easily shows how, when, and where to use each type of warning light for maximum safety under all weather conditions and all types of roads and speeds.

Send $1. for each Planner — personalized with your name

Go DIETZ *and you go Safely*

R. E. DIETZ COMPANY
Dept. 59 Syracuse 1, N. Y.

VERSATILE...
BIG
SMALL
HIGH
HEAD
LOW
HEAD
RUGGED
Flexible

That's Lock Joint Concrete Pipe!

Whether it be the largest concrete pressure pipe in the world, or a small diameter drainage pipe;
. . . . pipe for the highest heads common to water works practice, or pipe for only nominal pressure or partial vacuum;
. . . . pipe to resist extremes of overburden, or pipe to meet the complexities of industrial or plant piping;
. . . . LOCK JOINT can provide all these, and more.

You will also find it a dependable, durable, maintenance-free pipe of sustained high carrying capacity which is backed by a company with over a half century's experience in the development and production of concrete pressure, sewer, culvert and subaqueous pipe.

LOCK JOINT PIPE CO.
East Orange, New Jersey

Sales Offices: Chicago, Ill. • Columbia, S. C. • Denver, Col. • Detroit, Mich. • Hartford, Conn. • Kansas City, Kan. • Perryman, Md. • St. Paul, Minn. • Winter Park, Fla

Pressure • Water • Sewer • REINFORCED CONCRETE PIPE • Culvert • Subaqueous

ENGINEERING NEWS-RECORD

Vol. 165, No. 13 September 22, 1960

Number of copies printed in this issue 86,612

CONTENTS

Wage Rates: Report and Outlook 55

NATIONAL AFFAIRS

$1 Billion Worth of Dams and Canals 43
Hurricane Donna Does Her Dirtiest 44
Precast Concrete Bents Frame Tall Motel 46
Round Butte Hydro Plans Okayed 48
MWD Still Balks at Bond Issue 48
Expressway to Slash Across Manhattan 50
New Fallout Shelter Specs 50

FEATURES

Estimating Building Costs Faster (Method I) 88
Estimating Building Costs Faster (Method II) 92

INFORMATION SERVICE CENTER 137

INTERNATIONAL

Long Suspension Span Shapes Up 146
Fabricator Tests Circular Shop 154
Japanese to Complete Tollroad 154

RESEARCH AND DEVELOPMENT

Camera Rig Records Pavement Condition 158
Rumble Strip Warns Drivers 160
Corps Studies Fish Survival 160
BPR Sets Standard Specs for Motor Graders 162

NEW PRODUCTS

Trailers: More Versatile, Lighter, Stronger 174
Bituminous Curber Moves 4 ft per Minute 176
Machine Regrooves Tires on Truck 176

MEN AND JOBS

The Most Harassed Man in the AASHO 183

BUSINESS AND FINANCE

Aluminum Firm Pushes Redevolpment 247
States Need More Roadbuilding Money 249
Contractor Sues for $12.5 Million 249

LABOR

Agreement Makes Jobs All Union 251
Maintenance Becomes a Problem 252
Hawaii Gets Master Labor Pact 252
AFL-CIO Bids for Engineers 253

Reader Comment ... 10
Washington Observer 41
Publications 105
Legal 139
Books 191
Construction Reports. 198
Statistics, Indexes ... 245
Editorials 262

Picture Credits

Cover—United Nations; 44, 45 top left—Wide World; 45 top right, bottom—Dresser Manufacturing Division; 45 middle—U. S. Army Corps of Engineers; 46, 47—ENR; 48, 154—McGraw-Hill World News; 50—James Forney.

Back issues of ENGINEERING NEWS-RECORD *are generally available for the previous six months. Semiannual indexes will be sent on request.* ENGINEERING NEWS-RECORD *is also indexed in Industrial Arts Index and Engineering Index.*

THE CONSTRUCTION WEEK

SOFT MARKET—International Harvester Co. will shut down three of its construction equipment plants for two weeks in November to reduce inventories. Less than a month ago, Caterpillar Tractor Co. laid off 3,000 workers at its Peoria plant (ENR Sept. 1, p. 69). Indications are contractors looking for machinery will find prices on the soft side.

TIME OUT—"Time" was called in the Federal Power Commission's main event—the conflicting applications for Nez Perce and High Mountain Sheep dams (ENR Sept. 15, p. 24). The FPC delayed proceedings for two weeks to give its staff and intervening conservation groups more time to prepare their testimony. FPC staff and intervenors now are set to file on October 7.

BACK TO CIVVIES—Auditors for Malan Construction Corp., New York City, this week said their client subbed out only 54% of work on the Atlas base at Offutt AFB, Neb. Corps of Engineers had put the amount at 90% (ENR July 28, p. 21). With Offutt work completed, Malan swore off ICBM jobs and tackled, among others, an $18.3-million contract with a $6,500 bonus-penalty clause for two passenger terminals at Chicago's O'Hare International Airport.

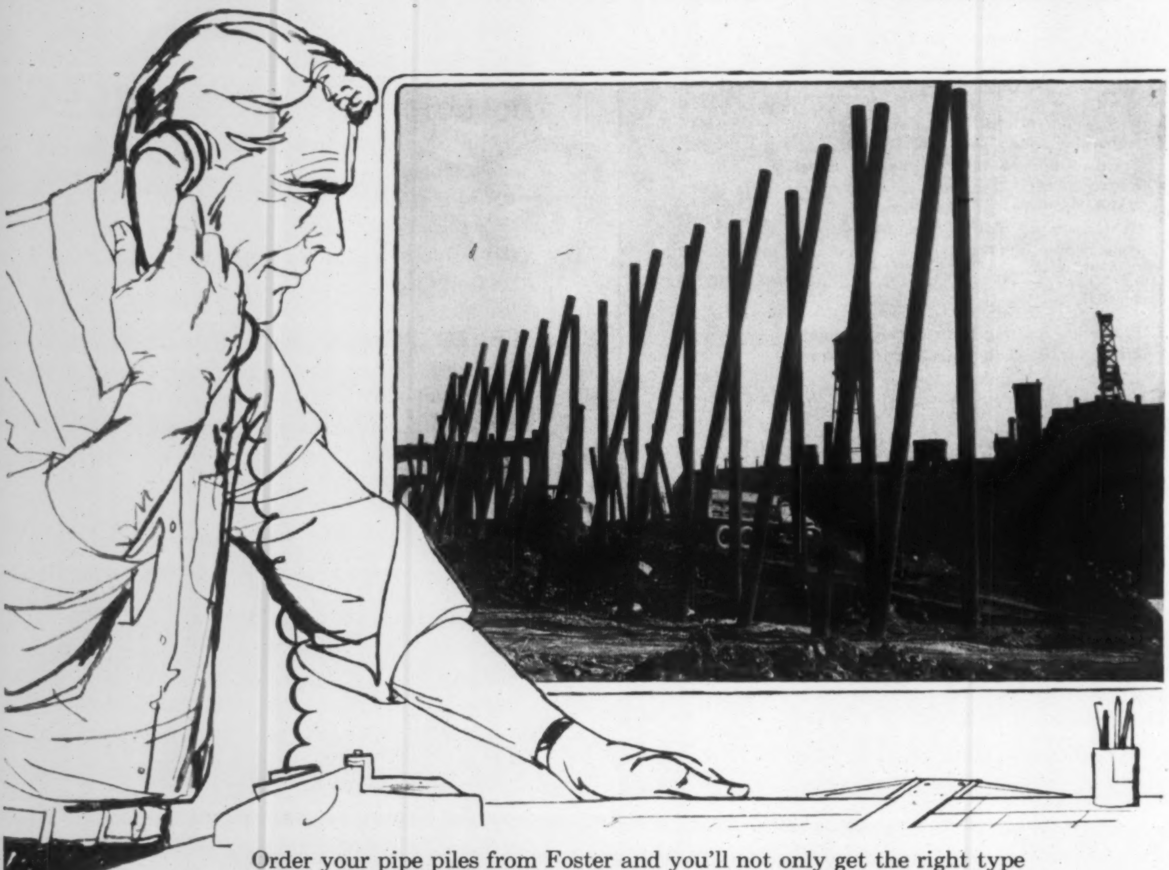
BIGGEST TURBINE STARTS UP—The Tennsessee Valley Authority started its 500,000-kw steam turbine-generator at Widows Creek Steam Plant this week. Although eventually to be eclipsed by a 650,000-kw unit under construction for TVA's Paradise, Ky., plant and an 800,000-kw unit under consideration for a TVA plant to be built at some yet-to-be-determined site, the Widows Creek unit is the world's biggest turbine-generator for the time being.

COMPETITION FOR AIA—The Society of American Registered Architects held its second annual meeting last week. The young organization is competing with the more firmly entrenched American Institute of Architects for membership. Matt E. Howard, Houston, was elected to succeed Wilfred E. Gregson, founder of ARA, as president.

SAVING WITH STEAM—The New York City Housing Authority expects to save $40,000 a year in maintenance costs by purchasing steam instead of heating with oil at four new developments in Manhattan. Steam, says the authority, will save another $1.2 million in cost of boilers and their housing.

BIG BROTHER AT THE DALLES—Closed circuit television will be watching over things at The Dalles Dam in Oregon. Two cameras will guard a gateway and survey the north shore, while a third keeps check on the reservoir pool. A fourth camera will watch the downstream face of the spillway.

"Call FOSTER get pipe for piling... PLUS"



Order your pipe piles from Foster and you'll not only get the right type of pipe, in the exact diameter and wall thicknesses your job requires, but you'll get a big "plus." All deliveries are "fast" . . . on time. And where Foster's high-strength thin wall pile is your choice, you get your pipe piles cut to the exact lengths you need—so you'll have no wasteful cut-offs, and a fraction of the normal number of splices.

Foster's nationwide warehouses stock every kind of pipe for piling—economical thin-wall spiral-weld pipe, electricweld, lap-weld, and seamless pipe, in all diameters, and in a full range of wall thicknesses. We can supply pipe for practically every use—fabricated to your needs.

Here's another Foster "plus"—you can coordinate dependable, fast deliveries to allow you to meet any driving schedule. For every type of foundation pipe, for Rental Steel-Sheet Piling, Foster Lightweight Piling, H-Bearing Pile, Driving Accessories, and a wide range of highway and construction products, call your nearest L. B. Foster Company office.

For the new Piling CatalogEP-9Awrite or call **L. B. FOSTER CO.**
Pittsburgh 30, New York 7, Chicago 4, Houston 2, Los Angeles 5,
Atlanta 8, Cleveland 35.

Faster From Foster

PIPE · VALVES AND FITTINGS · PILING · RAIL · TRACK MATERIAL

WASHINGTON OBSERVER

- **Housing bouncing back?**
- **Corps looks ahead**
- **Prequalification on basebuilding starts**

- **The dip in housing may have hit bottom a month ago.** New housing starts statistics out this week carry brighter news.

  In July, housing starts plummeted by more than 100,000. That worried builders, lenders and the federal government. There were fears starts might slip 100,000 to 200,000 under the modest but healthy rate of around 1.3 million predicted for 1960.

  But August figures are up over the July low. There are 127,400 starts in August to give a seasonally adjusted annual rate of 1,275,000. That compared with the horrible July of 111,300 for the month and 1,184,000 for the seasonally adjusted annual rate. The August rate is below June's 1,302,000 to be sure, but is on the rise. Add that heartening news to the increased number of VA and FHA applications for mortgage insurance, and you come up with a not-too-bad conclusion: Housing isn't a bellwether of prosperity so far in 1960—but neither is it a portent of recession.

—

- **The Corps of Engineers is examining new public works projects for future authorization and construction.** The Corps has some $9 million to make feasibility surveys on more than 250 projects. What the studies develop will first go to the Bureau of the Budget for approval, and then to Congress for authorizing legislation. Money to start comes later.

  Surveys will be made in 46 states covering flood control, navigation, beach erosion and "special" projects, which cover Great Lakes harbors, hurricane studies, Ohio River and Potomac River reviews, and the like.

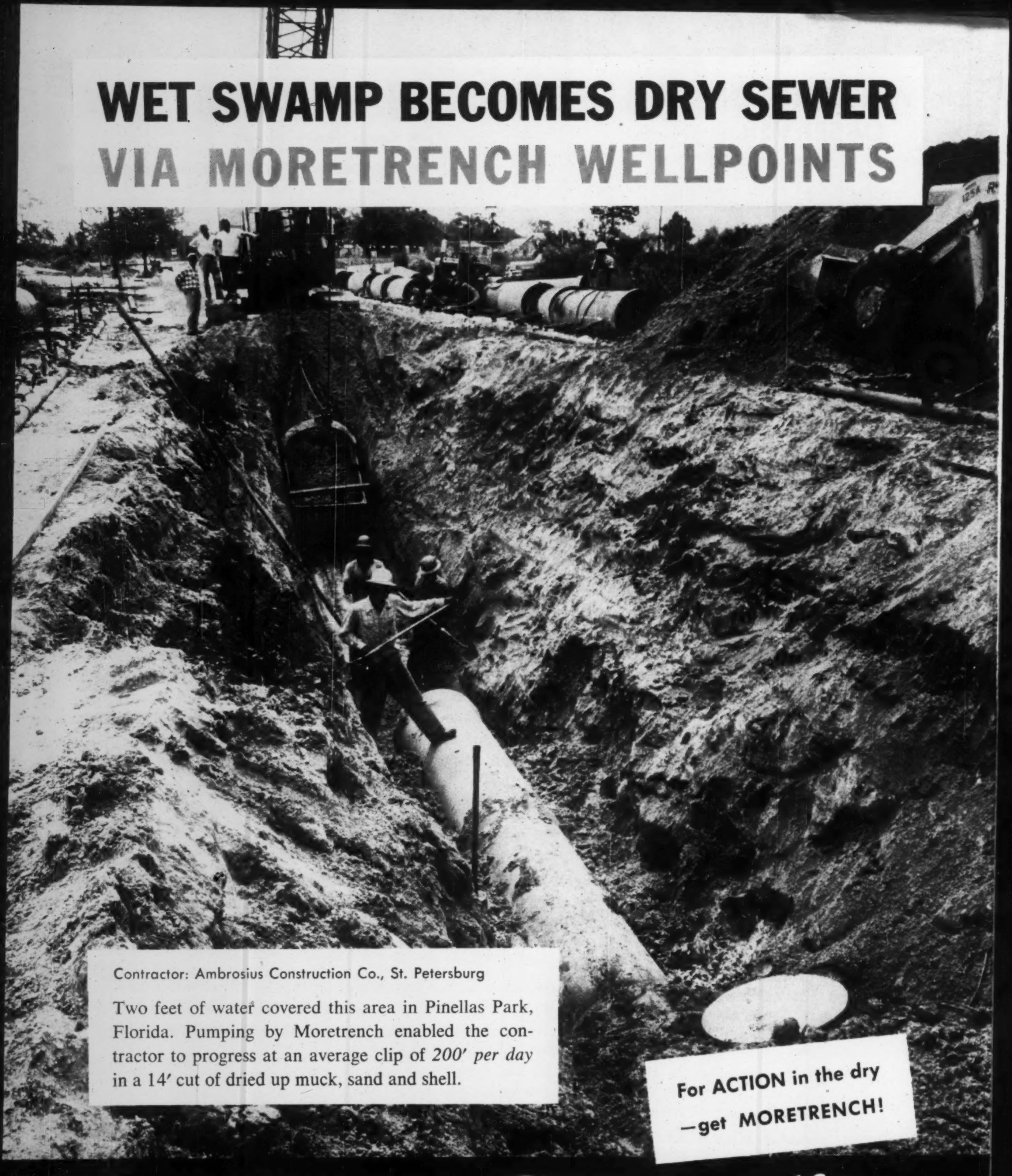
—

- **Prequalification of bidders for missile base construction will start this week.** The Corps of Engineers will send invitations to selected contractors for competitive bids on less than $1 million worth of road and utility work at Vandenberg Air Force Base, Calif.

  Bidding on the first Minuteman ICBM base will be by invitation only. Bids for the $40-million, 150-launcher Minuteman base at Malmstrom AFB, Great Falls, Mont., will be accepted only from contractors with a record of performance which makes timely and efficient construction certain. The Corps of Engineers Ballistic Missile Construction Office in Los Angeles wants to minimize chances for further lags in missile base construction. Bid invitations will go only to contractors with proven ability to do jobs well and on schedule.

  Any contractor left off the approved list can ask the office for a chance to bid. The test of how tough the prequalification list is will come on the appeal route.

  BMCO is gradually taking over construction supervision on bases already under construction. Last week the office assumed responsibility for the $100-million project comprising two Titan squadrons at Lowry AFB, Denver. On September 30, the office will take charge of two going jobs, one at Plattsburgh, N. Y., and the other at Ellsworth, S. D.



WET SWAMP BECOMES DRY SEWER
VIA MORETRENCH WELLPOINTS

Contractor: Ambrosius Construction Co., St. Petersburg

Two feet of water covered this area in Pinellas Park, Florida. Pumping by Moretrench enabled the contractor to progress at an average clip of *200′ per day* in a 14′ cut of dried up muck, sand and shell.

For ACTION in the dry —get MORETRENCH!

Moretrench Corporation

389 Main Street
Hackensack, N. J.
HUbbard 9-7676
New York Tel.: CO 7-2283

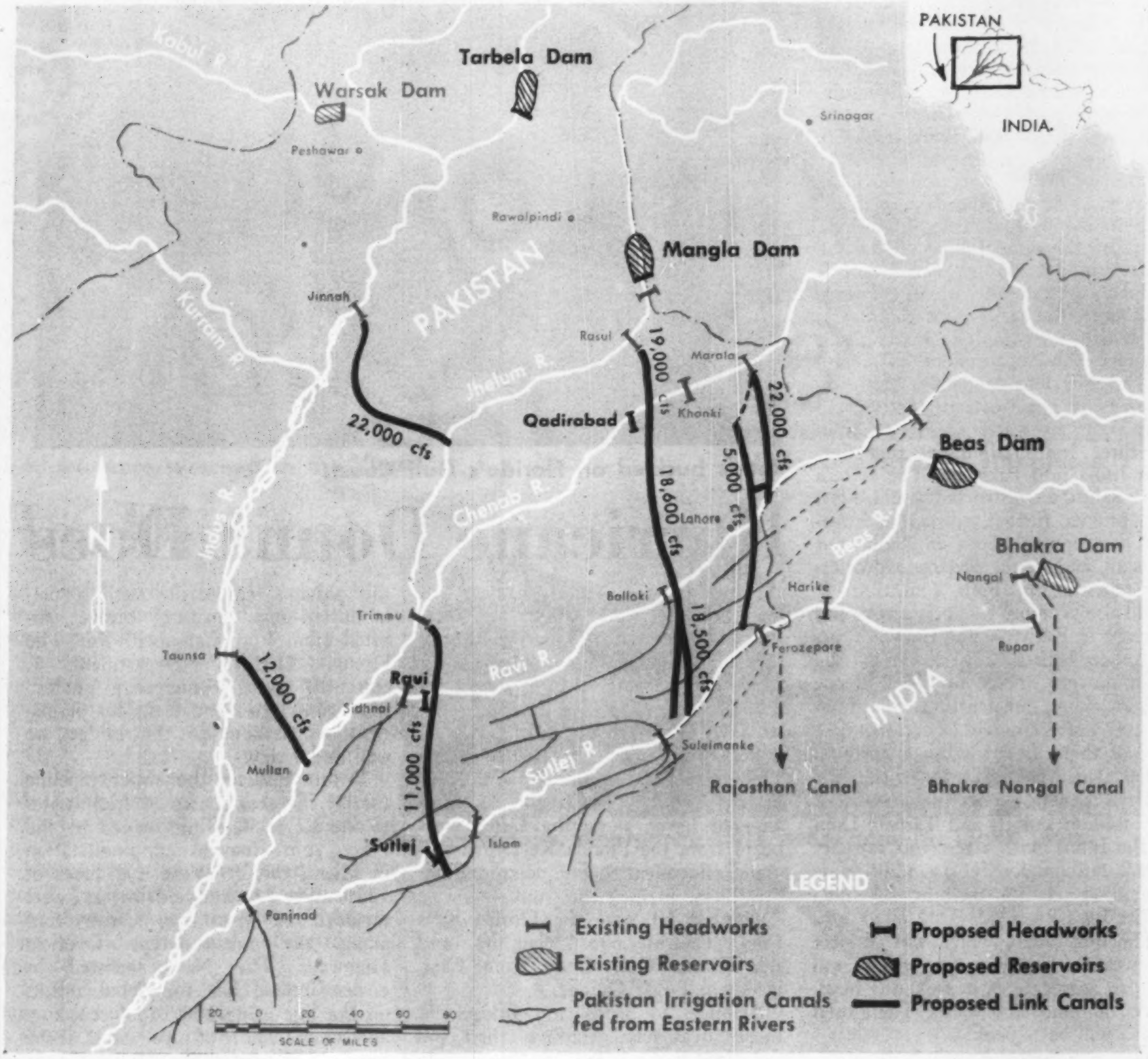
4900 S. Austin Ave.
Chicago 38, Illinois
POrtsmouth 7-4212

7701 Interbay Blvd.
Tampa 9, Florida
TAmpa 61-1881

315 W. 25th St.
Houston 8, Texas
UNderwood 4-7774

Rockaway
New Jersey
OAkwood 7-2100

WESTERN REPRESENTATIVE: Andrews Machinery of Washington, Inc., Seattle 4, Washington
CANADIAN REPRESENTATIVE: Geo. W. Crothers Limited, Toronto, Ontario
BRAZILIAN REPRESENTATIVE: Oscar Taves & Co., Ltd., Rio de Janeiro


PAKISTAN
INDIA
Kabul R.
Tarbela Dam
Warsak Dam
Peshawar
Srinagar
Rawalpindi
Mangla Dam
PAKISTAN
Jinnah
Kurram R.
Rasul
19,000 cfs
Marala
22,000 cfs
Jhelum R.
Khanki
Qadirabad
22,000 cfs
5,000 cfs
Beas Dam
18,600 cfs
Chenab R.
Lahore
Beas R.
Indus R.
N
Bhakra Dam
Nangal
Harike
Balloki
Trimmu
18,500 cfs
Ferozepore
Rupar
Taunsa
12,000 cfs
Ravi
Ravi R.
Sidhnai
INDIA
Suleimanke
11,000 cfs
Multan
Sutlej R.
Rajasthan Canal
Bhakra Nangal Canal
Sutlej
Islam
Panjnad
LEGEND
Existing Headworks
Existing Reservoirs
Pakistan Irrigation Canals fed from Eastern Rivers
Proposed Headworks
Proposed Reservoirs
Proposed Link Canals
20 0 20 40 60 80
SCALE OF MILES

India-Pakistan treaty clears the way for . . .

$1 Billion Worth of Dams and Canals

India and Pakistan signed a treaty this week settling a 13-year dispute over the distribution of the waters of the Indus River and its tributaries. The dispute has raged since partition of the Indian subcontinent in 1947.

Boundaries set at that partition cut across major irrigation systems, placing India, upstream, in a position to divert waters and dry up large districts of West Pakistan. In addition, India's construction of Bhakra Dam will soon enable it to store and divert the flow of eastern Indus tributaries into its new Bhakra-Nangal and Rajarthan Canal systems.

The two countries alone had little success in settling their differences, and in 1951 the International Bank for Reconstruction and Development, commonly called the World Bank, offered to help them work out a solution. These World Bank efforts ended in a plan, presented in 1954, to make West Pakistan and India independent of one another in respect to the waters of the Indus and its tributaries.

The proposal suggested that the waters of the "eastern" rivers—Beas, Ravi and Sutlej—be allocated to India, while those of the "western" rivers—the Indus and its tributaries, the Jhelum and Chenab—be reserved for Pakistan. But since large areas of Pakistan had to rely on waters from the eastern rivers, the proposal also provided that diversions from these streams by India would be replaced by surplus waters from the western rivers. This replacement of the eastern river waters was to be made by canals linking the western to the eastern rivers.

The amount of surplus that would exist in the western rivers after Pakistan had satisfied its water needs became a point of disagreement. Consequently, modifications of the plan were presented by the World Bank in 1956. Essentially, they sought to settle the question of surplus water by providing for water storage on the western rivers, since some 60 million to 70 million acre-ft of the annual flow of the Indus system goes to sea unused. It is this plan, substantially, which goes into effect with the signing of the treaty. Target date for completion is 1970.

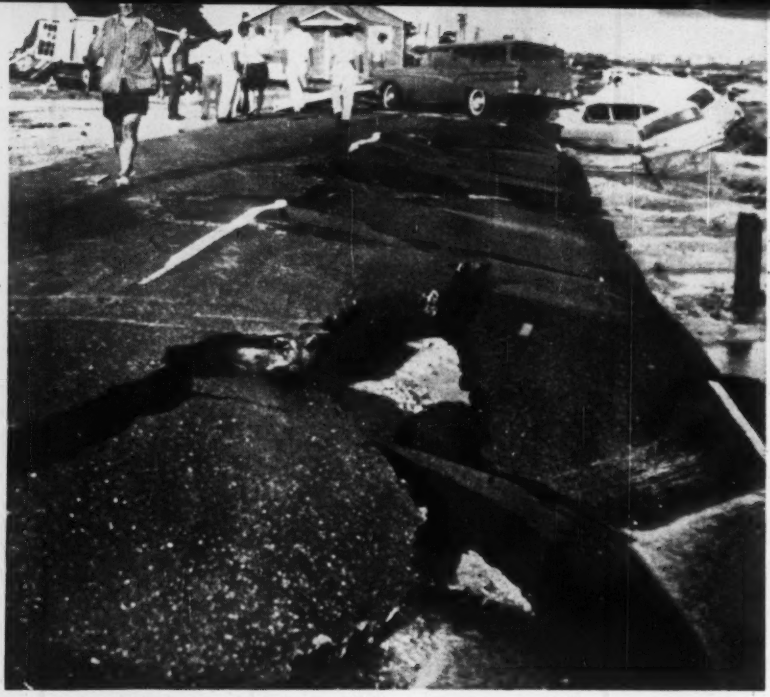
Under the replacement plan, India has agreed to contribute to the financing of construction that would compensate for water she diverts from the three Indus tributaries that flow from India into Pakistan. The system of works to be constructed would, however, provide further substantial irrigation development both in India and Pakistan, and would develop hydroelectric potential in both countries. It would also promote soil reclamation and drainage in Pakistan, and provide flood control in both countries.

To provide storage of water in the western rivers, construction of a number of reservoirs was recommended. Two of them are to be given priority: in Pakistan, Mangla Dam, on the Jhelum River, with a reservoir capacity of 4.75 million acre-ft; and Tarbela Dam on the Indus, with a reservoir capacity of 4.2 million acre-ft. In addition, a new storage dam is included for India on the Beas River.

The link canals, which will connect the western to the eastern rivers, will have an aggregate capacity at the headworks of some 80,000 cfs. Their total length will be 620 miles.

The plan will also include construction of the tube wells for drainage in reclaiming land that has become waterlogged and loaded with salts.

The U.S. will put up over half the billion-dollar cost of Indus development. Of this amount, Pakistan will receive a dollar grant of $177 million, a $235-million grant in rupees and a $70-million loan from the State Department's Development Loan Fund, repayable in rupees. India will receive $35 million from the DLF. Pakistan will also get a $175-million hard-currency grant from India and hard-currency grants totaling $133 million from Great Britain, West Germany, Canada, Australia and New Zealand. The World Bank will lend $80 million to Pakistan and $23 million to India.



Roads buckled on Florida's Gulf Coast.

Hurricane Donna Does

Some isolated major damage to roads, bridges, water and power lines, and buildings trailed behind Hurricane Donna's swishing skirts last week amid the more plentiful debris of splintered pleasure boats, shattered windows and uprooted trees.

Beginning her northward sashay 1,100 miles southeast of San Juan, P. R., Donna rocked, wrecked and wreaked havoc along the eastern seaboard from the Florida Keys to southern Connecticut before disappearing, breathless, in New England.

Hardest hit were the Florida Keys from Tavernier to Marathon and the Florida Gulf Coast from Everglades to Punta Gorda.

Damage to roads and bridges in these areas—less extensive than anticipated—is estimated by the Florida State Road Department at some $650,000—$500,000 of the total in the Miami-Keys region.

Where damage occurred, specifically on the Overseas Highway, U. S. Route 1, running from Miami to Key West, it was mainly the result of washed-out fills behind bridge abutments. Five bridges are reported to have been thus destroyed, but rock-fill crews are putting them back into service.

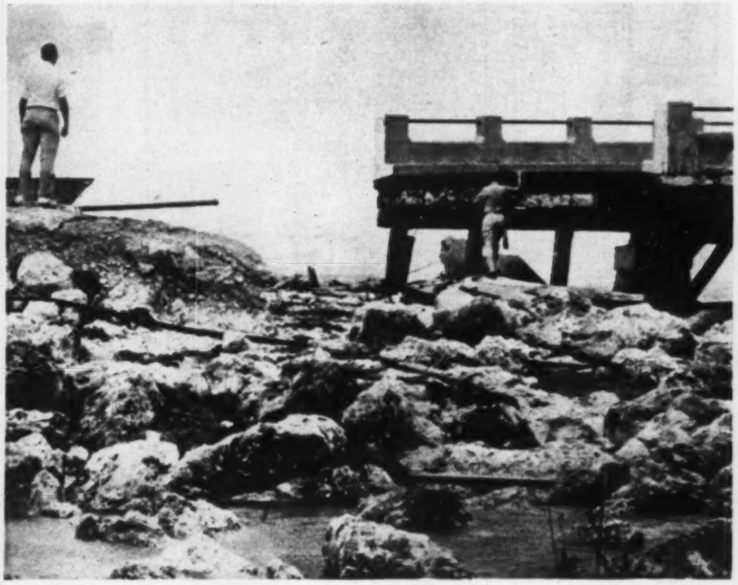
Bridge structures stood up well, with the exception of a 160-ft span of the 200-ft-long concrete-and-steel Tea Table Relief Bridge at Matecumbe Key. The hurricane slammed a barge against the structure, knocking out several piers. Army Engineers spanned the passage temporarily with a prefabricated-truss floating bridge airlifted from Fort Campbell, Ky. The Florida Highway Department is currently taking "emergency quotes" from contractors and plans for permanent replacement of the bridge are well under way.

Donna ravaged the water pipeline that is the sole source of fresh water to the Keys. The line owned by the Navy, runs from a pumping station in Miami to Key West, a distance of 125 miles. A hundred breaks were recorded in this line, which runs along the causeway-type Overseas Highway. The Navy, assisted by civilian crews, has completed repairs on the line using 100 16-in. couplings and some 5,000 ft of pipe. Most of the repairs were made on the strip from Key Largo to Marathon.

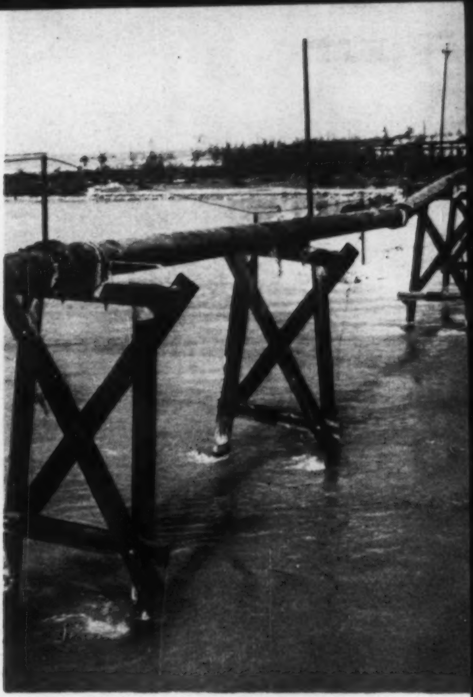
Homes and buildings on the Keys and Gulf Coast were hard hit—only 25% of the buildings escaped destruction. The town of Bonita Springs, 23 miles south of Fort Myers, was completely wiped out.

All seem to agree that shoddy construction, regulated by no code and subject to little or no inspection, was responsible for most losses. On the Keys there has been widespread amateur weekend building, and along the Gulf Coast, in Monroe County, the degree of damage indicated a lack of proper regulation of construction.

Roof losses ranked high, but concrete structures with tie beams and hurricane clips on roofs fared well as



Bridges were wrecked in the Keys.



Water line broke in 100 places.

Her Dirtiest

did well-braced frame structures. Homes on concrete and steel stilts weathered best.

Land-fill developments—particularly the muck-covered mangrove swamp variety—were a mess, especially in spots along canals not protected by bulkheads. Rock-filled areas came through a lot better. Houses built on concrete slabs atop muck stood the gaff. Whether cracking will come later is another question.

Miami, on the other hand, protected by a rigid construction code, came through almost unscathed. Some windows and storefronts, not boarded up, had broken glass.

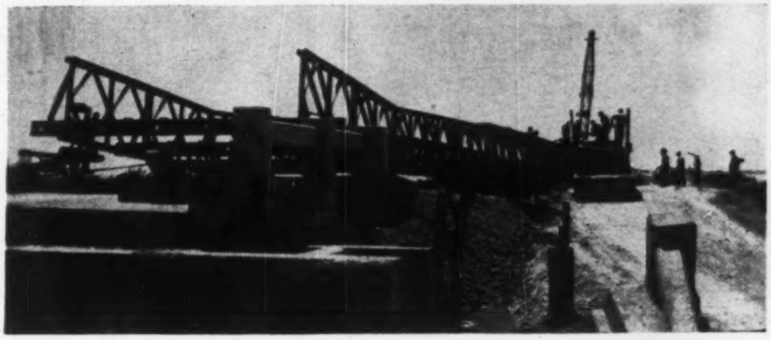
Farther north on the East Coast, there was isolated damage.

North Carolina reported an estimated half million dollars in storm damage to roads and bridges.

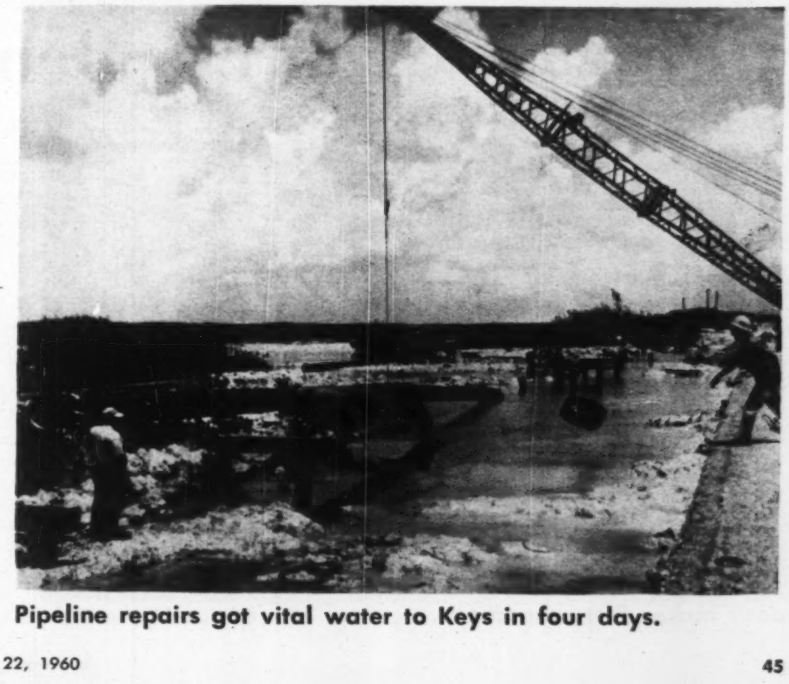
New York and Long Island saw severe tides one foot above the highest ever recorded, but aerial inspection revealed no serious structural damage to shorelines. On Long Island, there was some basement and road flooding, but nothing of any real magnitude.

A small town 25 miles southeast of Albany, N. Y., apparently right in the flood plain, suffered a flash flood that covered the entire village with 5 to 10 ft of water.

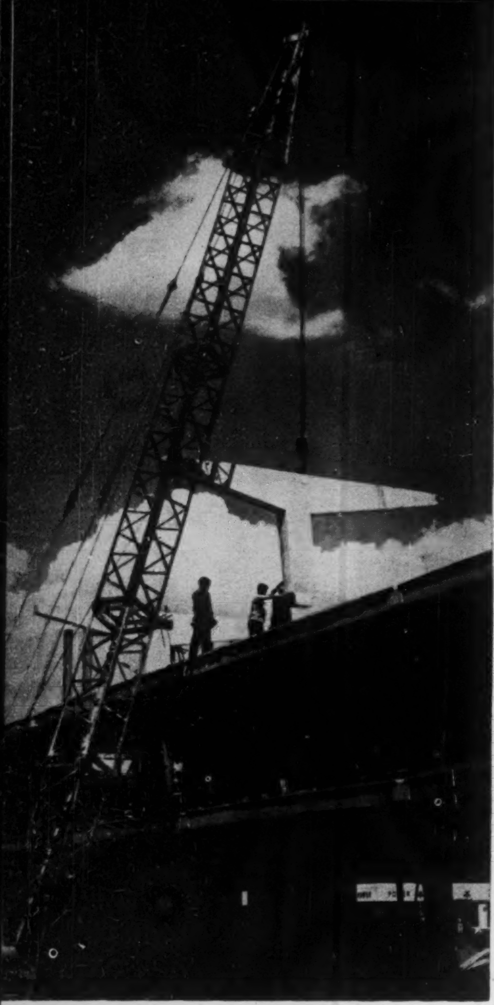
In New England, there was some flooding in coastal areas of Rhode Island, Connecticut and Cape Cod. Tides ranged from two to ten feet above normal, but, fortunately, the storm hit when the tides were receding.



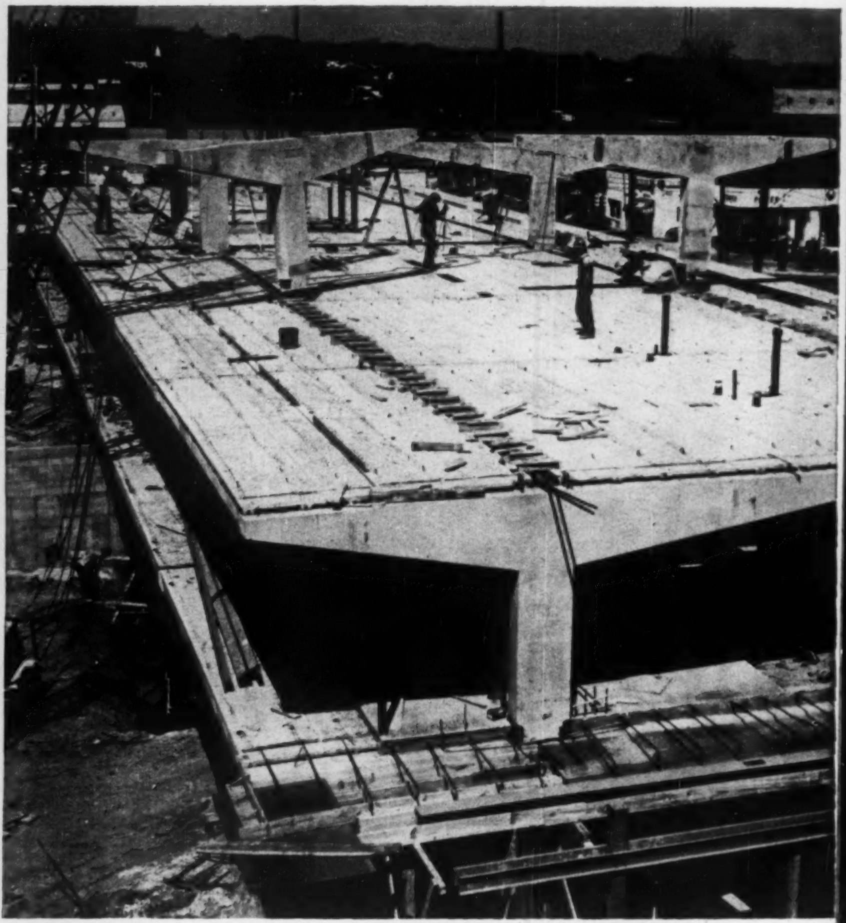
Bridge repairs, emergency style, were done in eight hours.



Pipeline repairs got vital water to Keys in four days.



Workmen place T-frames . . .



in pairs to form bents that carry five stories of precast concrete

Precast Concrete Bents Frame a

Epoxy makes first connection.

Precast concrete T-frames, each consisting of two cantilever beams and a column, were combined in pairs to frame a five-story motel in Macon, Ga. Seven bents made of these T-frames were erected at each level. The bents are placed 28 ft apart, span 50 ft.

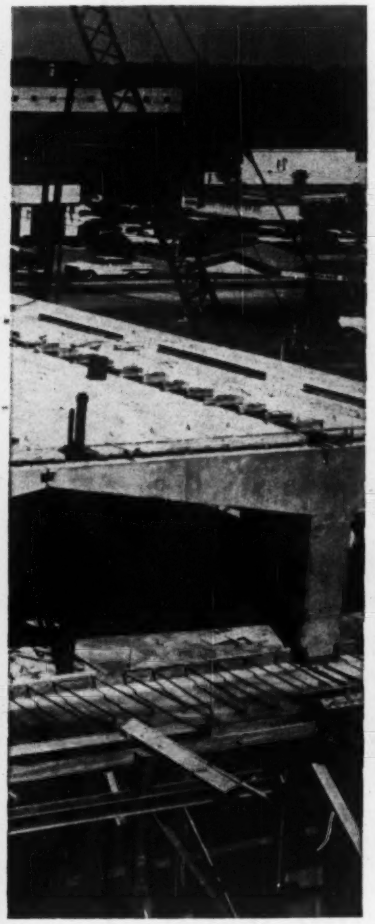
Truck cranes placed the members from opposite sides of the building. Before setting a T-frame in place, workmen applied an epoxy bonding agent to the top of the column below, providing a quick-set connection.

After each pair of T-frames was positioned, checked for plumb and guyed, they were welded into place with three connections. Two of the connections joined rods projecting up from the columns below to plates cast in the base of each column above. The third weld joined the cantilevers where they met at the center of the building.

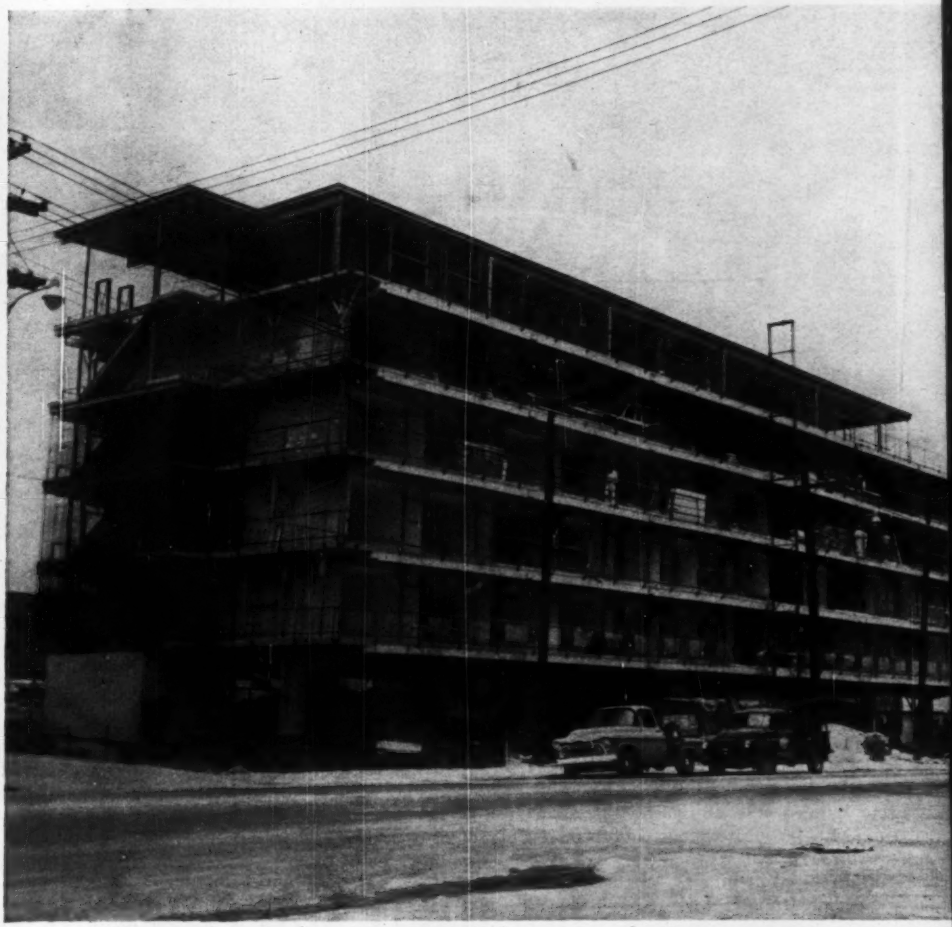
Next, workers laid precast concrete plank the length of the structure. Gaps were left in the deck along the column lines and later filled with concrete to form cast-in-place struts to brace the bents. These struts were cast as workmen laid down the cement finish on each level.

In the completed motel, the precast frames, given a rubbed finish, are left exposed.

Exterior walls along the length of the building are prefabricated plastic panels consisting of two laminated sheets of glass-reinforced polyester material. The architect claims the material has saved $38,000 in air-conditioning equipment because of its high insulating value. He says they also provide good acoustical in-



floor plank.



Nearly completed motel is ready to receive plastic facade.

Tall Motel

sulation. The end walls are masonry block, plastered on both sides.

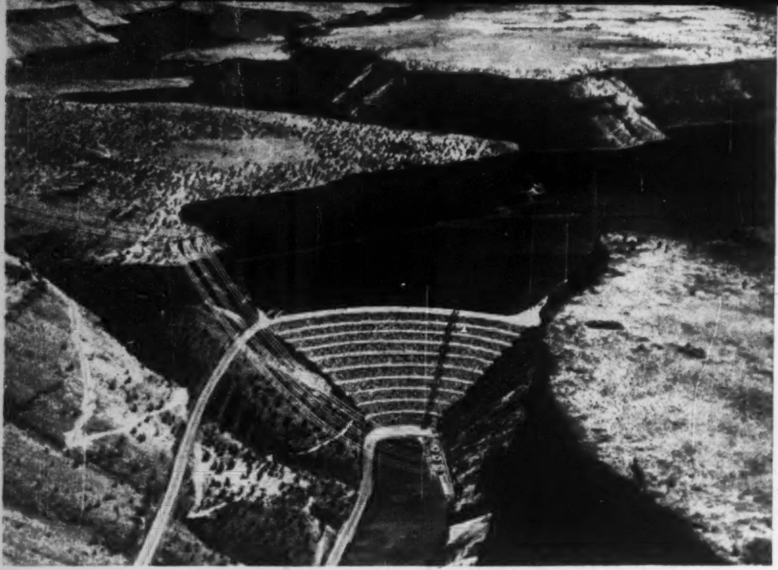
The designers paid particular attention to sound control inside the building. Interior partitions are double, completely independent walls separated by 1-in. strips of cork and ¾-in. vertical channels.

A penthouse extending almost the full length of the motel was built with a light steel frame.

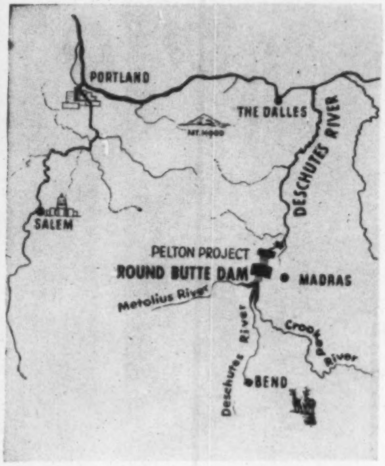
Total cost of the structure is $650,000. An adjacent garage, providing 30,000 sq ft of space on two levels, cost $60,000.

Architect for the project is Bernard A. Webb of Macon. Demetrius A. Polychrome, Atlanta, is the structural engineer. The general contractor is H. G. Tinker Construction Co., Macon. Precast components were made and erected by the Prestressed Co.

Welder ties cantilevers, later completes bottom connections.



The rockfill dam will have a 1,355-ft crest length.



Three rivers join just upstream.

Round Butte Hydro Plans Okayed

Portland General Electric Co., Portland, Ore., last week won Federal Power Commission authority to build its $72-million Round Butte hydroelectric project on the Deschutes River.

The 247,050-kw Round Butte project will be the largest hydroelectric project completely within Oregon's borders. The dam, a 440-ft-high rockfill structure, will be located in a 1,000-ft-deep canyon. It will require more than 8 million cu yd of fill.

Site of Round Butte is just downstream from the confluence of the Deschutes with the Crooked and Metolius rivers. The three-pronged reservoir will reach six miles up the Crooked, eight miles up the Deschutes and 11 miles up the Metolius (ENR Aug. 30, 1951, p. 24).

FPC licensed the Round Butte project as part of the company's existing Pelton project, seven miles downstream. The 120,000-kw Pelton project and the Round Butte project will be operated as a unit.

The utility had hoped FPC would license Round Butte as a separate project.

PGE is waiting for a license for Round Butte from the Oregon State Water Resources Board before beginning construction. The company wants state approval of Round Butte to ease tensions still existing from construction of the Pelton project.

Oregon didn't license Pelton, but PGE built it under a U.S. Supreme Court decision that held that state water laws need not apply to projects touching on federal reservations.

One abutment of the Pelton project rests on the Warm Springs Indian Reservation. An abutment of Round Butte will also rest on this property.

The same sport and commercial fishing interests that opposed the Pelton project are fighting Round Butte at WRB hearings. Among them are several PGE stockholders who are also fly fishermen.

As at the Pelton job, where $5 million of the $25 million cost went for fish passage facilities, the Round Butte project is designed with specialized fish equipment. Upstream migrants will be carried over the dam in an automated tank elevator. Downstream migrants will be passed through the dam in a 20-in. siphon.

Portland General Electric has also agreed to replace a state park that will be partially flooded by the reservoir. Included in the cost of the Round Butte project is construction of a 110-mile, 230-kv transmission line from the site to Salem, Ore.

MWD Still Balks on Bond Issue

Chances of California voters approving a bond issue in November to finance the proposed $1.75-billion Feather River-Delta diversion project may hinge on the continued refusal of the Metropolitan Water District to support the measure.

The MWD, California's largest wholesale water agency, has consistently refused to endorse the plan, which would permit them to distribute some 1.5 million acres of northern California water in its southern California service area. The district insists it first must have an "acceptable" contract.

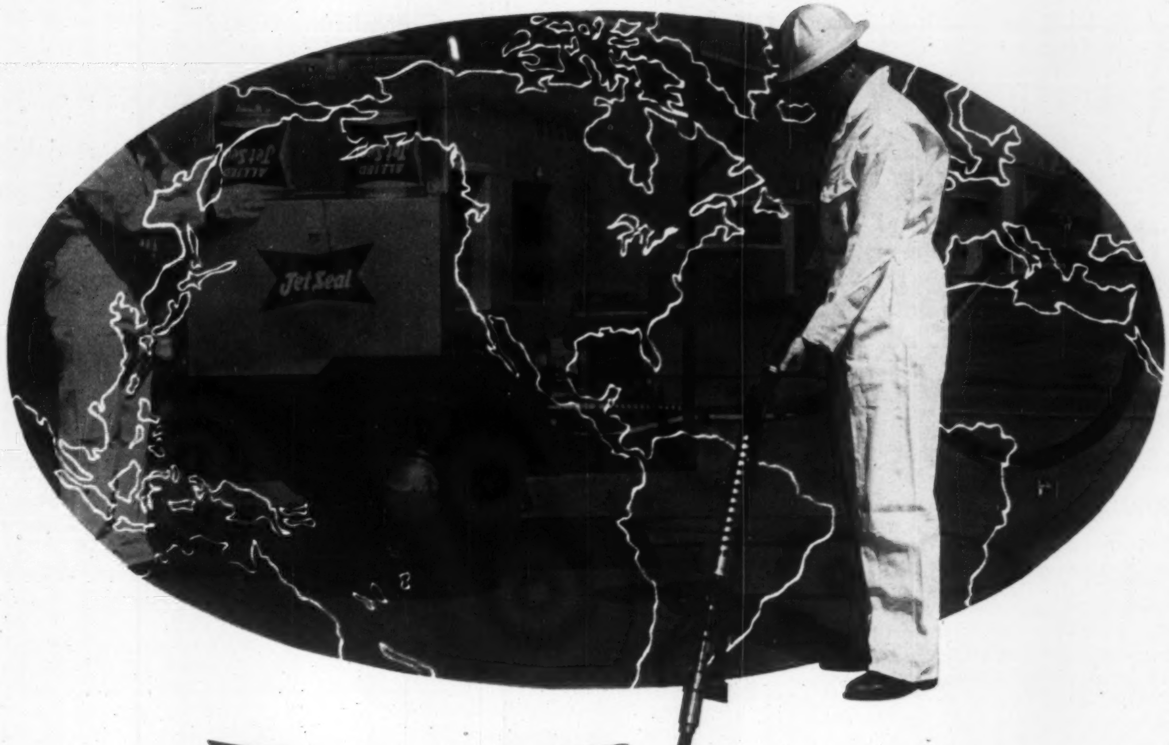
After months of negotiation, Gov. Edmund G. Brown last week submitted his version of what he termed a "final" contract to the district. It was promptly rejected as "unacceptable."

Deadline for the final contract had been set for September 13. After studying Governor Brown's version of the contract on that date MWD registered disappointment and sought a further meeting with the governor the following day. That meeting ended in failure. Neither side budged from its position. However, Governor Brown did promise to take the matter up again with Harvey Banks, director of California's Department of Water Resources, and meet again with the MWD, probably within the week.

Meanwhile, the district's board has scheduled a meeting for September 27. If by then there is no acceptable contract forthcoming, MWD will probably issue a public statement of its reasons for not endorsing the bond issue for the Feather River scheme, which Californians will vote on in November.

MWD wants firm assurances that it will get its fair share of Feather River water and that it will pay no more than its fair share of the total cost of the project. These assurances, the district insists, should be confirmed in a contract prior to putting the proposition before the voters in the November general election.

According to MWD, Governor Brown's proposal not only fails to give these assurances, but makes any contract subject to approval by the 1961 legislature. The district holds that if the contract will be subject to statutes later to be enacted by the legislature, then the bond referendum ought to be postponed.



ALLIED Jet Seal . . . the Thin Black Line that SAFEGUARDS Runways AROUND THE WORLD!

What happens to the ordinary runway joint sealant when confronted with today's jet engines? Does the terrific heat and blast tear the material and melt it from the joint . . . leaving it damaged, or even bare?

Allied JET SEAL is unaffected by the terrific heat and blast of jets. It has no flow, even at elevated temperatures of 200°F or more. It is resistant to jet fuel and other solvents, including new-type hydraulic fluids.

Using the new, exclusive Allied Applicators, Models 8591-D and X691-F, application of the sealant in the joint is a simple, fast operation. The two components are contained in five-gallon pails for easy handling.

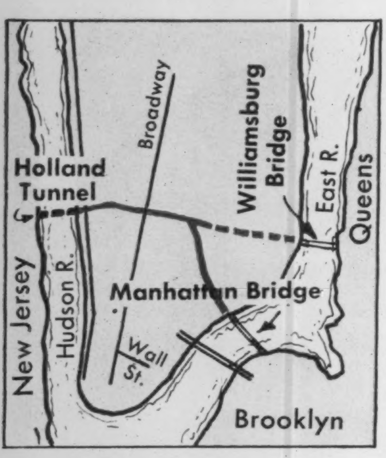
For more information on ***ALLIED JET SEAL,*** developed to meet and TOP military specifications for a concrete joint sealant, write to:

ALLIED MATERIALS CORP.

PRODUCERS, REFINERS AND COMPOUNDERS OF SPECIAL ASPHALT PRODUCTS

ALLIED BUILDING • 5101 N. PENNSYLVANIA • P.O. BOX 7278 • 39TH STREET STATION • OKLAHOMA CITY, OKLA.
PLANTS: STROUD, OKLA. • DETROIT, MICH. • LOS ANGELES, CALIF.

CIRCLE 49 ON READER SERVICE CARD



$84-Million Expressway To Slash Across Manhattan

The proposed $84-million Lower Manhattan Expressway, which will ease travel between New Jersey and Long Island, won the approval of the New York City Board of Estimate last week.

The expressway, scheduled for completion in 1966, will link the Holland Tunnel under the Hudson River with the Williamsburg and Manhattan Bridges over the East River (ENR Feb. 11, p 25).

Most of the Lower Manhattan Expressway route will be an elevated structure. The exception is the approach to the Williamsburg Bridge, which will be underground.

Construction of the planned expressway is expected to relieve congestion caused by trans-Manhattan travel of half the 150,000 vehicles that cross the Williamsburg and Manhattan Bridges each day.

Merritt-Chapman & Scott Indicted for Bribery

Merritt-Chapman & Scott Corp., New York City, contractor for the $98-million Priest Rapids Dam on the Columbia River in Washington, was indicted by a grand jury last week on nine courts of bribery involving the project.

The indictment charges that MC&S gave cash and goods worth more than $6,950 to Glenn A. Smothers, who resigned in 1958 as manager of Grant County Public Utility District. The alleged bribes were in conjunction with a $1-million extra work order, since declared illegal, given to MC&S by Mr. Smothers without bid calls. No MC&S officials were named in the bill.

An MC&S spokesman said, "We are confident . . . there is no basis for the indictment." The company is urging an early trial "so the facts can be publicly disclosed."

Office of Civil and Defense Mobilization issues . . .

New Specs for Fallout Shelters

The Office of Civil and Defense Mobilization has issued additional requirements and exceptions to its existing criteria for design of prototype community and group fallout shelters. The revisions are aimed primarily at preventing both underdesign and overdesign.

OCDM has available federal funds for grants to aid construction of typical public and family fallout shelters. Purpose of the program is to encourage state and local governments, industry, homebuilders and home owners to build similar shelters. Criteria for design of these shelters are given in two OCDM publications, NP-10-1, Fallout Shelter Surveys: Guide for Executives and NP-10-2, Fallout Shelter Surveys: Guide for Architects and Engineers.

The latest revision requires that: "The shelter shall be designed to provide as economically and austerely as practicable, complete, independent survival facilities for at least two weeks."

The areas developed as fallout shelters must have a minimum protection factor of 100. (Protection factor is the ratio of the amount of radiation that would be registered by a detector in the protected location to the amount it would report if it were unprotected.) Where a higher protection factor exists or can be attained economically, the design is acceptable, but funds should not be expended to attain a factor exceeding 1,000.

Full advantage should be taken in the shelter areas of air conditioning facilities that have been planned for peacetime usage.

In addition to the usual filters provided for the ventilating system, space should be provided for future installation of CBR filters. These are standardized units, ranging in capacity from 300 to 5,000 cfm. Rectangular in shape, they consist of a plywood casing containing activated charcoal and a particulated section made of pleated fabric with a screen at one end.

The shelter should have at least two widely separated means of egress. The width of each should be at least 22 in. for every 200 persons to be accommodated in the shelter.

Not more than 10 sq ft of net floor area should be allotted per person.

Congress has voted $2.5 million in each of the last two years for the prototype shelter program. During the first 12 months of active operation, OCDM approved 230 projects involving close to $2.6 million of federal funds. Approvals to come will commit the rest of about $4 million available for construction.

OCDM expects to round out the roster of prototype shelters before year end with approval of 20 or more additional proposals.

Of the 230 prototypes approved, 179 are family shelters, 33 are community type and 18 are classified as special. OCDM contracts have been signed with local owner-builders for 115 of the approved projects, and 63 of these have been completed.

In general, community shelters are those incorporated in public buildings. OCDM also finances other shelters of larger capacity. It has approved 18 of these special types for construction in schools, hospitals and one in a highway fill. It is considering other special types, such as shelters in abandoned street railway tunnels and dome-type shelters above ground where the water table is high.

OCDM pays only the cost of the shelter, plus certain built-in items, such as lavatories, emergency generators, air filter, ventilation and water storage equipment. Shelter areas must be made available for public viewing on a regular schedule and for special groups by arrangement for at least five years. OCDM may also use the shelters for experimental purposes.

Food, bedding, rescue tools and similar survival equipment must be supplied by the owner.

One recent award of $150,000 was for an 11,425-sq-ft shelter in the basement of the new $2.5-million Lakeview High School near Battle Creek, Mich. The shelter will accommodate 1,200 students and provide 925 sq ft of storage area.

Floor, roof and walls of the shelter will be 12-in.-thick reinforced concrete slabs. The roof slab will be supported on beams and columns. (The shelter is not designed to withstand a nuclear blast.)

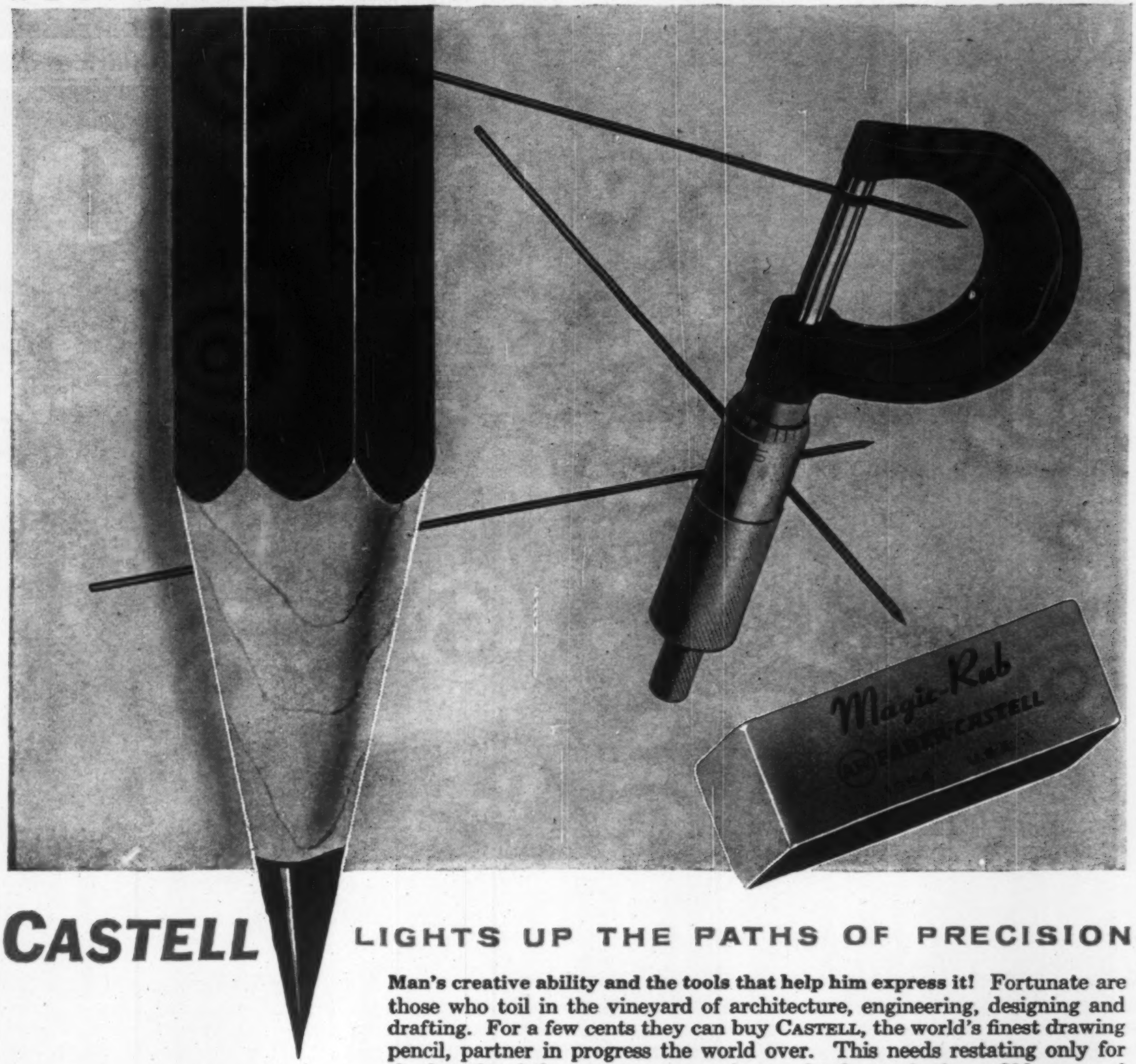
Auxiliary equipment includes an emergency power plant, ventilating system, sewage and water pumps and ventilator fans.

The shelter will also be put to use for recreation, supplementary classrooms and meeting rooms.

OCDM is considering a request for $250,000 for a similar shelter to be constructed at Marshall College, Huntington, W. Va. It will be 182 x 82 ft. Located between the dining hall and woman's dormitory in the center of the campus, it will be built of solid concrete blocks and covered with 2 ft of earth. The roof will be 8-in.-thick reinforced concrete.

Air conditioned, the shelter will be used for instruction and recreation. It will have four classrooms, a recreation room and a snackbar.

HELPS THE HAND THAT SHAPES THE FUTURE



CASTELL LIGHTS UP THE PATHS OF PRECISION

Man's creative ability and the tools that help him express it! Fortunate are those who toil in the vineyard of architecture, engineering, designing and drafting. For a few cents they can buy CASTELL, the world's finest drawing pencil, partner in progress the world over. This needs restating only for the benefit of the young now coming up in the profession. Old seasoned hands have known it for generations. CASTELL is an unquestioned fact in a creative man's life.

#9000 CASTELL Pencil with world's finest natural graphite that tests out at more than 99% pure carbon. Exclusive microlette mills process this superb graphite into a drawing lead that lays down graphite-saturated non-feathering lines of intense opacity for cleaner, more durable originals and clearer, sharper prints. Extra strong lead takes needlepoint sharpness without breaking or splintering. Smooth, 100% grit-free consistently uniform pencil after pencil, in full range, 8B to 10H.

#9007 CASTELL Pencil with Eraser.

CASTELL *Rubberless MAGIC-RUB ERASER soaks up graphite without abrading drawing surfaces, and residue rolls off. Leaves no "oil" stain or "ghost." Tests highest in ease of use, line removal and non-smudging. Tests first on Cronar and Mylar base films. For all papers and vellums.*

#9800SG CASTELL LOCKTITE TEL-A-GRADE Holder, perfectly balanced, lightweight, with new no-slip functional grip that lightens finger pressure without slipping, and *relieves finger fatigue.* Unique degree lead indicating device.

#9030 CASTELL Refill Lead, matching exactly #9000 pencil in quality and grading, degrees 7B to 10H, packed in reusable plastic tube with gold cap.
Many other styles and colors of CASTELL Pencils, Holders and Refill Leads.

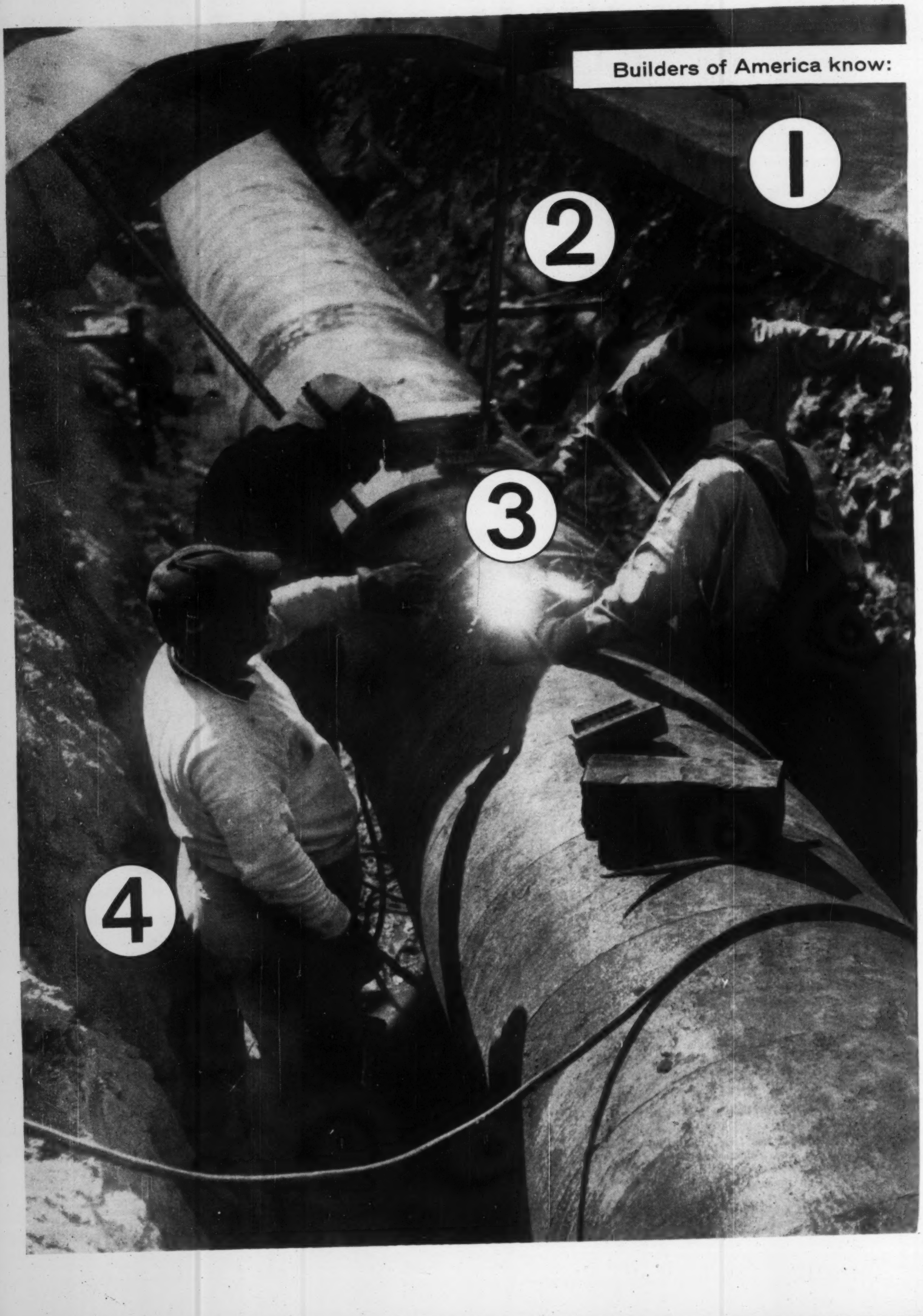
A.W.FABER-CASTELL 41-47 Dickerson Street, Newark 3, N. J.

A.W. FABER CASTELL DRAWING REFILL LEAD 9030

CASTELL Pencils and Leads draw perfectly on all surfaces, including Cronar and Mylar base films. Give graphite-saturated lines, easy to erase, no ghosting — excellent reproduction.

CASTELL LOCKTITE TEL-A-GRADE 9800SG
H

CIRCLE 51 ON READER SERVICE CARD



Builders of America know:
1
2
3
4

American Mutual aims at Better Protection . . . Lower Cost

This pipeline job could cost lives, limbs, cut profits, if...

1. Highway traffic runs into ditch.
2. Pavement is undermined.
3. Welding shields are inadequate.
4. Sidewall of ditch caves in.

Installing or repairing pipe underground can be a dangerous job. While the work is going on an accident could suddenly break down your schedule, resulting in loss of men, materials, equipment . . : money.

Combatting accidents is one of your most troublesome jobs, but the experienced advice that AM men can give you may be of considerable help in saving lives, limbs and dollars. And that in turn could mean lower operating costs, lower insurance rates, and a better bidding position on your next job.

But let's look at results. Over the years, American Mutual has built up an enviable reputation in the construction industry. Their advice and suggestions have helped many contractors finish their jobs quicker, safer and with more profit. That's what we mean by *better protection . . . lower cost.*

Why not talk to an AM man yourself, and see what he can do for you? Or ask for names of AM policyholders near you (we'll be glad to send them), so you can judge AM people by their actual achievements. Write American Mutual, Dept. EN-5, Wakefield, Mass.

Our business is protecting your business . . . better

"The First American Liability Insurance Company" . . .
a leading writer of Workmen's Compensation,
all forms of Liability, Crime, Automobile,
Group Accident and Health Insurance.

American Mutual
LIABILITY INSURANCE COMPANY

CIRCLE 53 ON READER SERVICE CARD

BORDEN
First IN FLOOR GRATING
ELIZABETH, N. J.

HERE'S HOW BORDEN FLOOR GRATING CUTS COSTLY FIELD CORRECTIONS

Insures correct dimensions, fit, and placement . . .

1. A shop drawing of the job submitted to the customer for approval, when necessary. This plan shows the size and shape of the grating area—how grating clears all obstructions.
2. Each finished panel is carefully checked for accuracy of dimensions.
3. Each panel is plainly marked with its number to insure quick, easy installation.
4. The entire platform is laid out on our shop floor. Over-all dimensions and obstruction openings are checked against shop drawings.
5. Erection diagram showing panel mark numbers is supplied for field installation.

BORDEN METAL PRODUCTS CO.

Gentlemen:
"Please send me NEW 1960 BORDEN Catalog"
NAME ....
TITLE ....
COMPANY NAME ....
ST. AND NO. ....
CITY AND STATE ....

Write today for free 16-page catalog showing all basic types of grating; more than 30 dimensional drawings of sub-types; eight safe load tables for steel and aluminum grating.

BORDEN METAL PRODUCTS CO.

"Greatest name in gratings"

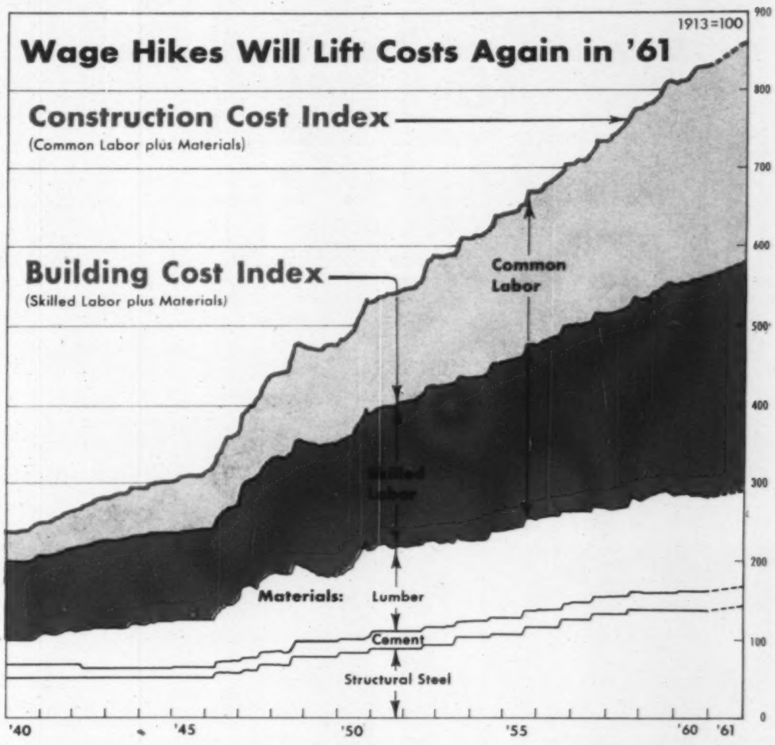
815 Green Lane   Elizabeth 2-6410   Elizabeth, N. J.
Plants at: Union, N. J. — Leeds, Ala.
Conroe, Texas — Beeton, Ontario

CIRCLE 54 ON READER SERVICE CARD

3rd Quarterly Cost Roundup

Wages: Pivot of Cost Outlook

- **The rest of 1960 will see a slight rise in basic costs measured by the ENR Indexes.**
- **Higher wages, prices of key materials will probably cause a more rapid increase in '61 than '60 in the ENR Cost Indexes:**
  - **Construction Cost Up 4%**
  - **Building Cost Up 3%**



The Cost Rise Slows Until 1961

The relentless rise of construction costs slows visibly as the Sixties begin. This year's experience—declining or steady materials prices and smaller wage raises—offers new hope for curbing construction cost inflation.

But construction men can afford neither to relax their determination to find new ways to cut costs nor drop their vigilance from cost trend charts. To do so would be to toss away an opportunity to restore profit margins that have proved especially elusive in the hotly competitive construction market of recent years.

Encouraging as is the slower rise in basic costs this year than last, alert contractors are aware of several readings on the cost barometers that point to a steeper uptrend in costs next year. Developments in 1960 that acted to stabilize costs will probably turn against contractors in 1961, add their weight to the cost push instead of offsetting

IN THIS REPORT . . .

Construction Labor Cost Outlook for '61 . page 58
Deferred wage increases for key trades in 20 U.S. cities in 1961, '62 and '63.

Construction Wage Rates in 45 Cities 60
Base rates and fringes in effect August 1, 1960, and deferred increases for 1961.

Union Wages, Hours and Earnings 62
BLS annual indexes, regional average rates.

Compensation Insurance Rates July 1960 64

Building Cost Indexes by Type & Region. 66

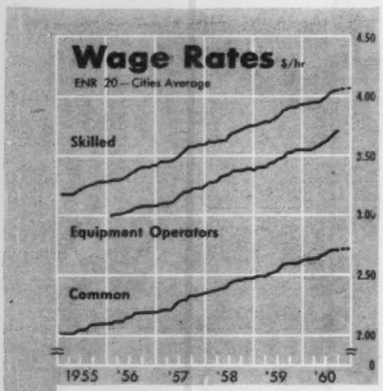
Heavy Construction Bid Price Indexes . . . 68
Highway, heavy construction, irrigation and hydro power cost indexes.

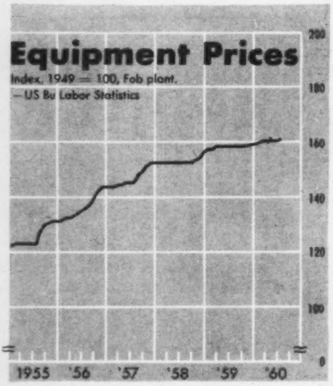
3 Ms: Materials, Machines and Money . . 70
Trend and '61 outlook for these factors.

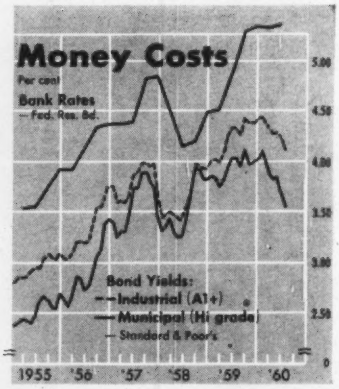
Construction Costs Round the World 72
Wages, materials prices, cost indexes.

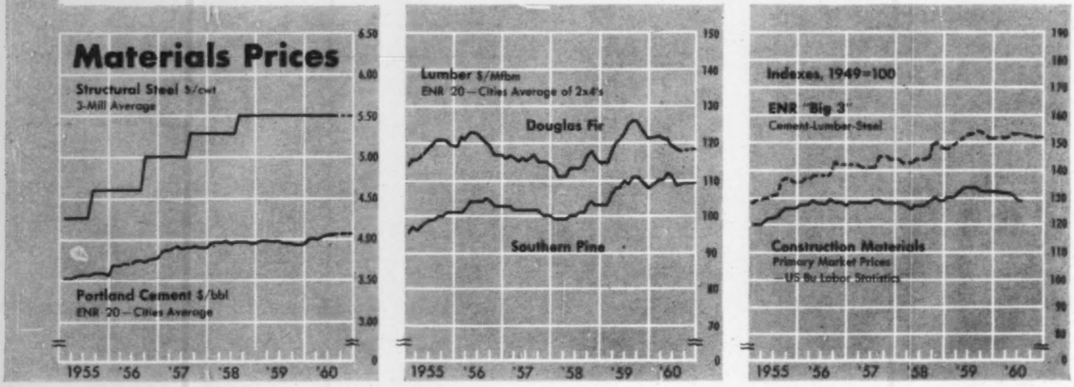
Building Prices in New York State 80
Elementary schools, public housing contract prices.

Unit Prices 95









other pressures as they did in 1960.

Between now and December, deferred wage increases in Denver and New Orleans will cause the ENR 20-Cities Cost Indexes to edge up by less than one point. By December 1, the ENR Construction Cost Index should be about 831.4, while the Building Cost Index will probably reach 563.0. Both indexes are based on 1913 costs as 100.

Based on these forward estimates, the Construction Cost Index will have increased by 3% during the 12 months of '60, compared to 4.3% in 1959. The Building Cost Index will be up only 1.9% for the full year, whereas it rose 3.4% in 1959. (These two ENR indexes differ in their labor component only. Common labor is used in the Construction Cost Index, which ENR established in 1921 and carried back monthly to 1913, annually to 1906. The Building Cost Index was established in 1938 when common labor rates began to rise faster than skilled; it uses a bricklayer-carpenter-structural ironworker average rate.)

Watch for a faster increase in the ENR Cost Indexes next year than in 1960. Wage raises next year are likely to average a penny or more higher than this year, based on 1960 deferred wage increases provided by long-term contracts and ENR's estimates for trades in the 20 cities that will negotiate new contracts in '61. However, rates in some cities will increase less next year than in '60.

Though wages will remain the chief cost escalator for 1961, materials prices are likely to exert a positive effect on costs in '61, instead of the negative effect as in 1960. Look for lumber prices to firm up, and for scattered increases in cement prices. There's also the possibility of a hike in mill prices of structural steel, which haven't changed since '58 despite increases in steel workers' wages, which will go up again in December.

With both wages and materials on the upside in '61, ENR's Construction Cost Index is likely to rise to a new record 863 by December '61, up 3.9% over the estimate for December '60, according to ENR's preliminary forecast. The Building Cost Index will probably rise 3% next year to a new high of 580.

The first stage of the 1961 cost rise will be propelled by several deferred wage increases in several cities on January 1. This will also be the effective date for any cement price boosts. A gradual rise in lumber prices and scattered deferred wage increases will keep nudging costs higher until July when, deferred wage boosts, increases under new labor contracts and a possible steel price increase will trigger the second and most powerful stage of the 1961 cost rise. ENR estimates that increases under new contracts negotiated next spring will be moderate, somewhat less than the average 1961 deferred increase under existing long-term contracts. The accuracy of this forecast depends on contractors sticking with "hold down wage inflation" strategy at the bargaining table.

Construction equipment list prices are likely to rise, particularly if steel prices go up in '61. Though price hikes may be limited to 3% or less, they are likely to be more widespread than in 1960. Plywood prices, which have firmed in recent weeks as mills cut back production, should follow this firming trend in 1961.

Warehouse prices of structural steel would probably rise if mills up prices. But rebar price tags are likely to remain unchanged regardless.

Money for construction loans should be easier to obtain and may cost less in 1961, at least to the banks' bigger contractor customers.

Contractor bid prices or selling prices in '61 will probably reflect more fully the 1960-61 increases in basic cost factors. Resurging volume of new business—ENR contract awards will set successive records in 1960 and '61—should take the edge off competition as contractors' backlogs grow. Ready availability of the Four M's—Materials, Machines, Manpower and Money—will help contractors maintain fast construction schedules and provide more opportunities to increase productivity.

8 out of 10 Sanitary Engineers assure

water-tight pipe joints

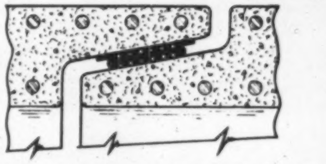
by using

TYLOX

flexible GASKETS

There are more TYLOX Rubber and Neoprene Gaskets in low head service than all other types of gaskets combined! . . . Most waste disposal designers specify TYLOX Gaskets, knowing from experience that they prevent water from leaking *in* or *out* of pipe joints. The diagram below of a TYLOX Type "A" Gasket on straight T & G pipe shows how . . .

Whether you are planning pipe lines of B & S, T & G, offset or recessed pipe of *any* size, there's a Tylox Rubber or Neoprene Gasket in the Hamilton Kent family of true compression Gaskets to make the joints water-tight for the life of the pipe itself. If you are not already thoroughly familiar with the advantages of TYLOX Gaskets, write for full information and engineering details.



TYLOX prevents joint leakage with a compression-tight seal. It reduces pipe-laying costs with quick assembly and fast pipe coupling. Acid-resistant, TYLOX never deteriorates.

This TYLOX GASKETED PIPE is being used on the following sewer installation:

PROJECT: West Side Trunk Sewer, West Side Sanitary District, County of Onondaga, New York, Onondaga Public Works Commission.

ENGINEERS: O'Brien & Gere, Consulting Engineers, Syracuse, N. Y.

CONTRACTOR: M. A. Bongiovanni, Inc., Syracuse, N. Y.

PIPE: Reinforced Concrete T & G Pipe, Manufactured by American-Marietta Company, Concrete Products Division, Syracuse District, Syracuse, N. Y.

HAMILTON KENT
MANUFACTURING COMPANY
KENT, OHIO
427 West Grant St. ORchard 3-9555

5133-3

NORTHWEST: Seattle 1, Wash., MUtual 2-7667 • CANADA: Cooksville, Ont., ATwater 9-3671

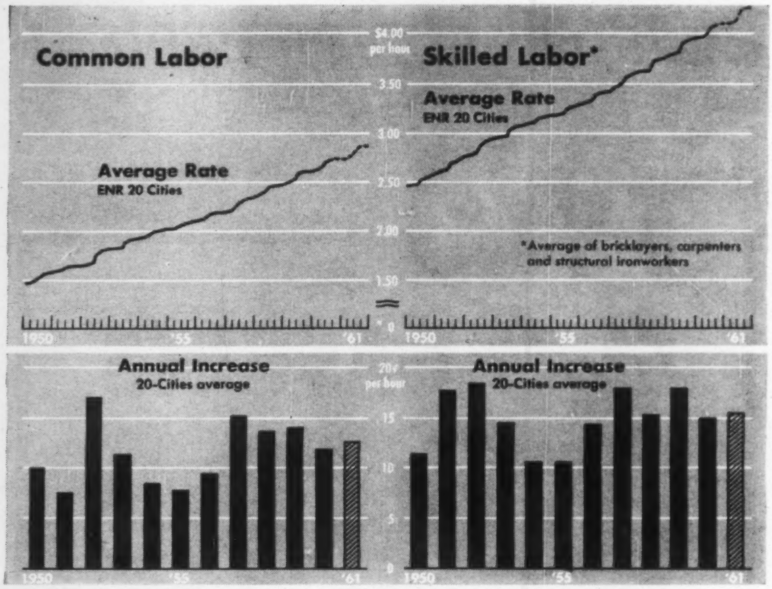
The Wage

Construction wage rates will climb for the 26th consecutive year in 1961.

Common labor rates, up 4.5% in 1960, will probably rise to a high of $2.87 by December '61.

The average of three skilled trades rose 3.8% this year and will likely advance to a record $4.25 per hour by December '61.

Common labor and skilled rates increased less in 1960 than in 1959. But next year will probably see bigger raises than 1960.



These Wage Increases Are Automatic During 1961-63

City	Common Labor: Building '61	'62	'63	Heavy Construction '61	'62	'63	Skilled Labor: Bricklayers '61	'62	'63	Carpenters '61	'62	'63	Structural Ironworkers '61	'62	'63
Atlanta	Exp. 6/30/61												Exp. 8/30/61		
Baltimore	2.5	....	....	2.5	....	....	5.0	....	....	12.5	....	....	2.5	....	....
Birmingham	Exp. 8/31/61						Exp. 9/1/61						Exp. 7/1/61		
Boston	10.0	Exp. 5/31/61		Exp. 4/1/62			15.0	....	....	Exp. 4/30/61			10.0	Exp. 6/30/62	
Chicago	Exp. 5/31/61						17.5	....	....	17.0	....	....	20.0	....	....
Cincinnati	Exp. 6/1/61														
Cleveland	Exp. 5/1/61														
Dallas	Exp. 7/1/61						5.0	Exp. 7/1/61		Exp. 1/29/62			Exp. 4/1/61		
Denver	Exp. 3/1/61						Exp. 4/1/61			5.0	Exp. 6/30/62		20.0	10.0	....
Detroit	10.3	Exp. 5/11/62		10.3	Exp. 5/11/62		Exp. 5/4/62			12.7	Exp. 5/4/62		15.0	Exp. 5/10/62	
Kansas City	12.5	12.5	12.5	12.5	12.8	12.8	12.5	12.5	....	12.5	12.5	....	12.5	12.5	12.5
Los Angeles	18.0	....	....	18.0	....	....	15.0	....	....	Exp. 4/30/61			32.5	....	....
Minneapolis	15.0	10.0	....	15.0	12.0	....	15.0	10.0	....	18.0	10.0	....	15.0	13.0	....
New Orleans	12.5	....	....	12.5	....	....	12.5	....	....	15.0	....	....	15.0	....	....
New York	21.6	32.4	....	21.6	32.4	....	40.0	....	....	21.6	32.4	....	50.4	28.0	....
Philadelphia	Exp. 4/30/61						15.0	....	....	Exp. 4/30/61			*	....	....
Pittsburgh	Exp. 5/31/61			Exp. 12/31/61			Exp. 5/31/61						Exp. 6/30/61		
St. Louis	20.0	20.0	....	20.0	20.0	....	Exp. 1/1/61			20.0	20.0	....	20.0	20.0	....
San Francisco	18.0	....	....	18.0	....	....	Exp. 1/1/62			22.5	Exp. 6/15/62		32.5	Exp. 8/6/62	
Seattle	15.0	Exp. 12/31/61		15.0	Exp. 12/31/61		Exp. 6/30/61			16.0	Exp. 12/31/61		16.0	Exp. 4/15/62	

City	Equipment Operators: Tractor '61	'62	'63	Power Shovel '61	'62	'63	Air Compressor '61	'62	'63
Atlanta	Exp. 6/30/61								
Baltimore	15.0	10.0	....	15.0	10.0	....	10.0	....	....
Birmingham	Exp. 9/1/61								
Boston	Exp. 2/28/61								
Chicago	15.0	....	....	15.0	....	....	15.0	....	....
Cincinnati	Exp. 6/1/61								
Cleveland	Exp. 5/1/61								
Dallas	*	....	....	*	Exp. 7/1/61				
Denver	Exp. 3/1/61								
Detroit	11.4	Exp. 5/1/62		11.4	Exp. 5/1/62		11.4	Exp. 5/1/62	
Kansas City	15.0	....	....	15.0	....	....	15.0	....	....
Los Angeles	25.0	....	....	25.0	....	....	25.0	....	....
Minneapolis	13.0	12.0	....	15.0	15.0	....	13.0	12.0	....
New Orleans	12.5	....	....	12.5	....	....	7.5	....	....
New York	21.6	32.4	....	21.6	32.4	....	21.6	32.4	....
Philadelphia	Exp. 4/30/61								
Pittsburgh	Exp. 12/31/61								
St. Louis	17.5	20.0	....	17.5	20.0	....	17.5	20.0	....
San Francisco	22.0	Exp. 6/30/62		23.0	Exp. 6/30/62		19.0	Exp. 6/30/62	
Seattle	Exp. 5/31/61								

* Currently negotiating new contract.

Construction Wages in ENR's 20 US Cities . . .

COMMON LABOR, dollars per hour

(Building and heavy construction average)

	1932	1939	1946	1949	1950	1956	1957	1958	1959	1960
J	.45	.68	.95	1.42	1.49	2.11	2.21	2.37	2.50	2.64
F	.45	.68	.97	1.42	1.49	2.12	2.22	2.38	2.50	2.64
M	.44	.68	.99	1.42	1.49	2.12	2.22	2.38	2.50	2.64
A	.41	.68	1.00	1.43	1.49	2.12	2.23	2.39	2.51	2.65
M	.41	.68	1.02	1.43	1.51	2.15	2.26	2.41	2.54	2.68
J	.41	.68	1.03	1.44	1.53	2.17	2.29	2.44	2.55	2.71
J	.41	.68	1.06	1.47	1.54	2.19	2.30	2.46	2.60	2.72
A	.42	.69	1.07	1.47	1.56	2.19	2.33	2.47	2.62	2.73
S	.43	.69	1.07	1.48	1.56	2.19	2.33	2.47	2.62	2.74
O	.43	.69	1.07	1.48	1.57	2.19	2.33	2.48	2.62	....
N	.43	.69	1.08	1.48	1.58	2.19	2.34	2.48	2.62	....
D	.43	.69	1.09	1.48	1.58	2.19	2.34	2.48	2.62	....
Av	**.43**	**.68**	**1.03**	**1.45**	**1.53**	**2.16**	**2.28**	**2.44**	**2.57**	....

SKILLED LABOR, dollars per hour

(Bricklayer, carpenter, ironworker average)

	1932	1939	1946	1949	1950	1956	1957	1958	1959	1960
J	1.15	1.43	1.70	2.35	2.46	3.30	3.46	3.63	3.78	3.95
F	1.11	1.43	1.73	2.35	2.47	3.31	3.46	3.62	3.79	3.95
M	1.11	1.44	1.74	2.38	2.47	3.31	3.46	3.63	3.80	3.95
A	.95	1.44	1.76	2.38	2.48	3.32	3.47	3.64	3.80	3.97
M	.96	1.44	1.77	2.38	2.49	3.34	3.49	3.65	3.82	4.00
J	.99	1.44	1.80	2.39	2.52	3.37	3.51	3.68	3.85	4.04
J	1.00	1.44	1.82	2.41	2.52	3.39	3.54	3.72	3.89	4.05
A	.98	1.44	1.83	2.44	2.54	3.41	3.58	3.73	3.90	4.06
S	.99	1.44	1.85	2.45	2.55	3.42	3.59	3.74	3.92	4.09
O	.98	1.44	1.85	2.46	2.57	3.42	3.60	3.75	3.92	....
N	.97	1.46	1.86	2.46	2.57	3.43	3.61	3.76	3.94	....
D	.98	1.46	1.87	2.46	2.58	3.43	3.61	3.76	3.94	....
Av	**1.02**	**1.44**	**1.80**	**2.41**	**2.52**	**3.37**	**3.53**	**3.69**	**3.86**	....

Averages include fringe benefits—see wage table by trades for each of 20 cities on page 42 for nature and extent of these—welfare fund, pension fund and others.

. . . and in New York City

Year	Carpenters 10-hr day	Bricklayers 8-hr day	Bricklayers, Helpers 8-hr day	Common Laborers 10-hr day	Structl. Ironwkrrs 8-hr day
1874...	$0.23	$0.43	$0.18	$0.14	....
	8-hr day			9-hr day	
1890...	0.43	0.47	0.28	0.14	....
				8-hr day	
1907...	0.63	0.70	0.38	0.22	$0.60
1913...	0.63	0.70	0.38	0.23	0.63
1930...	1.65	1.93	1.24	1.03	1.93
1932...	1.33	1.47	1.00	0.65	1.68
	7-hr day	7-hr day	7-hr day		
1939...	1.75	1.89	1.14	0.91	1.93
1949...	2.75	3.20	1.95	1.70	3.00
1959...	4.644	5.127	3.834	3.456	4.866
1960...	4.832*a*	5.333*b*	4.023*c*	3.643*a*	5.231*d*

FRINGE BENEFITS: Rates after 1950 include fringe benefits such as welfare, pension, vacation and general benefit fund. *a 4% WF-4% PF *b 5% WF, 20¢ PF, 15¢ VF, 1¢ promotion fund *c 5% WF, 3% PF *d 5% WF, 3% PF, 3% B, 1% VF

CONTRACT STATUS: Bricklayers' contract expires May 31, 1962; all other contracts expire June 30, 1963.

Outlook: Bigger Raises in '61

Construction wage inflation roars ahead, unchecked. And prospects are that 1961 will bring another round of hefty wage hikes, many of which are already written into long-term contracts.

But there's a ray of hope that contractors can do something to slow the wage spiral, if not stop it, in the years ahead. For example, while this year's wage hikes were substantial, they weren't as large on the average as last year's in the 20 cities checked regularly by ENR and included in the ENR Cost Indexes. This is a sign that a determined "hold the wage line" attitude of contractors at the bargaining table can win concessions from union demands.

Moreover, this year's experience also indicates a somewhat greater willingness on the part of unions to employ new labor-saving equipment and construction methods.

All but a few of the 1960 wage hikes for key trades in the ENR 20 cities have already become effective. Still to come: Denver structural ironworkers get a five-cent hourly hike Oct. 1; and in New Orleans, five-cent increases effective Nov. 1 go to laborers and several skilled trades, thus putting a period on the 1960 wage developments in the 20 cities.

The 1960 picture, then, is for average increases of 11.8 cents per hour, including fringe benefits, for common labor, and 14.9 cents on the average for the three key skilled trades—bricklayers, carpenters and structural ironworkers. These average increases in '60 are smaller than '59 by 2.3 cents, or 16% for common labor and 3 cents, or 17% for the three skilled trades.

Next year will see a few very large increases go into effect. Extreme examples include a 32-5-cent hike for structural ironworkers in Los Angeles and San Francisco, a 40-cent increase for New York bricklayers and a whopping 50.4-cent boost for New York structural ironworkers. But the majority of next year's deferred wage boosts for skilled labor will come to around 15 cents an hour.

Most common labor deferred increases for '61 are 15 cents or less. Largest will be 21.6 cents in New York and 20 cents in St. Louis.

The 1961 deferred increases scheduled by existing contracts are a firm launching pad for the inflationary boosts to be negotiated by trades whose contracts expire next year.

Common labor pacts will run out in 1961 in nine of the 20 cities. Eight bricklayers' contracts, nine carpenters' pacts and seven contracts for structural ironworkers will also expire. These unions will probably win 1961 increases averaging at least 11 cents for common labor, 12.5 cents for bricklayers, 12.8 cents for carpenters and 13.8 cents for structural ironworkers, ENR estimates.

These new contract increases and the deferred wage boosts would push ENR's 20-cities common labor wage average up 12.8 cents to $2.867 by December '61. ENR's average for these three skilled trades would rise 15.8 cents to $4.245 by December '61. These '61 increases would be about one cent per hour more than the 1960 average.

Construction equipment operators' rates will also rise again in '61. ENR's 20-cities average of rates for tractor, power shovel and compressor operators rose 14.9 cents to date in '60, reaching $3.712 in January. Deferred wage boosts ranging from 10 cents-32.4 cents per hour for these trades go into effect next year (see table).

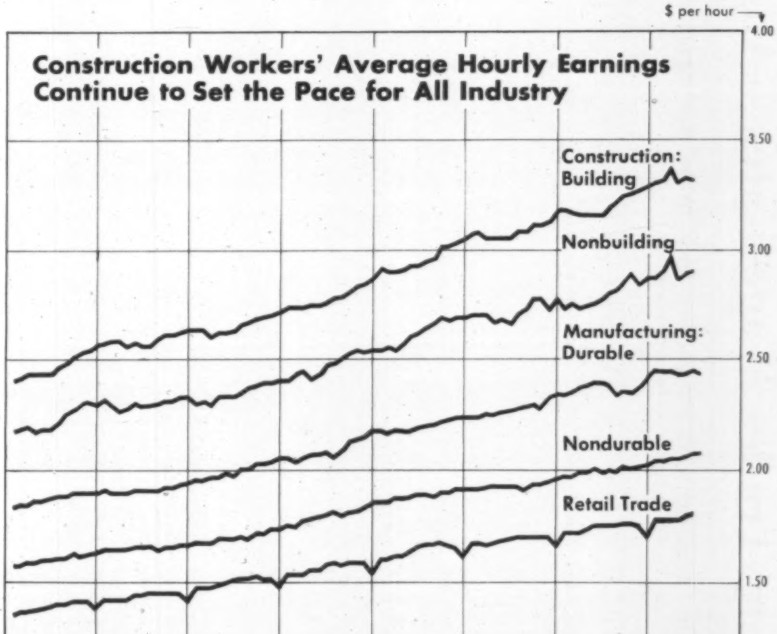
Though the actual wage increases negotiated in 1960 point to greater success of contractors in withstanding labor's heavy demands, many contractors seem resigned to the relentless cost push originating with wage raises. Many contractors among those quizzed by ENR's special survey of 45 major construction centers think that they've done all right if they hold wage increases to the national average approximately 15 cents per hour for skilled construction workers.

When it comes to bargaining over contract changes wanted by contractors to lift productivity, progress often hinges on the answer to the union's "What'll you give us" attitude. However, contractors generally are free to do pretty much what they wish in this area. For one thing, they are aided by the Landrum-Griffin law which, for example, facilitates installation of prefabricated items without fomenting union trouble.

Though contractors in many construction markets report that unions are cooperating to eliminate flagrant instances of "make work" arrangements, featherbedding exists in some areas.

A hot issue at many 1960 bargaining sessions was job security, with many unions demanding hiring halls. In Kansas, contractors gave unions a weapon to circumvent the state's "right to work" law by bowing under to demands for an exclusive hiring hall referral system.

Unions in several areas sought to entrench their positions by demands for eight-day union shop clauses and subcontractor clauses, now permitted by Landrum-Griffin. Indications are that labor will continue pressure in this direction.



Building Trades Wage Rates—August 1, 1960

Quoted in $/hr., 8-hr. day; time and one-half for overtime after 40 hr. except as noted. Fringe benefits are shown under base rates. Footnotes to base rates indicate deferred increases.

	Common Labor		Skilled Trades																			Equipment Operators					
	Heavy	Bldg	Bricklayer	Carpenter	Ironworker Struc	Ironworker Reinf	Stone Mason	Mason's Helper	Plasterer	Mosaic & Terr	Tile Layer	Cement Finisher	Lather	Electrn Inside	Painter	Glazier	Plumber	Steamfitter	Roofer	Waterproofer	Sheet Metal Wkr	Welder	Truck Dr 1½ T	Shovel Oper	Tractor Oper 30 hp	Hoist Engr 1-Dr	Air Comp	Air Tool
NEW ENGLAND																												
Mass, Boston	2.55 .10[4]	2.75 .10[4]	4.05*[51] .30[8]	3.65* .10[4]	4.14*[50] .20[7]	4.14* .20[7]	4.05*[51] .30[8]	2.75 .10[4]	3.80*[52] .45[9]	4.05* .30[8]	4.05* .30[8]	4.15*[58] .15[4]	3.90* .20[2]	4.10* .25[10]	3.35** .195[11]	3.355 .08[4]	3.90[54] .32[12]	3.90* .32[12]	3.60[55] .30[6]	4.15*[53] .15[4]	3.825* .26[13]	3.825* .26[13]	2.70 .23[14]	3.90 .20[7]	3.525 .20[7]	4.05 .20[7]	3.45* .20[7]	2.80 .10[4]
MIDDLE ATLANTIC																												
Md, Baltimore	2.275#[185] .075[4]	2.275#[185] .075[4]	4.10*[186] .15[25]	3.60*[184] .075[4]	4.00*[187] .178[26]	3.80*[187] .178[26]	4.10[186] .20[25]	2.375[188] .075[4]	3.85* .13[27]	3.49* .075[4]	3.49* .075[4]	3.50[78]* .075[4]	3.85* .13[27]	3.85b .105[28]	3.40b[181] .075[4]	3.425b[179] 075[4]	3.84*[189] .12[29]	3.84*[189] .175	3.90*[179] .12[4]	3.90*[179] .12[4]	3.65*[189] .28[31]	4.00*[187] .178[26]	2.20b[190] .075[4]	4.05*[191] .10[4]	3.65*[192] .10[4]	3.45*[191] .10[4]	3.25*[192] .10[4]	2.325b[193] .075[4]
NJ, Trenton	2.55[179] .30[170]	2.90*[77] .10[1]	4.25*[203] .15[1]	4.10*[204] .10	4.70*[204] .23[171]	4.70*[204] .23[171]	4.25*[203] .15[1]	....	4.25*[203] .15[1]	4.25*[203] .15[1]	4.25*[203] .15[1]	4.25*[202] .15[1]	3.75*	4.60* .275[172]	3.625*[205]	3.73*	4.40* .30[173]	4.40* .30[173]	4.20* .25[174]	4.20* .25[174]	4.20 .25[174]	4.10[79] .30[173]	2.91[206] .23[175]	5.10[16] .30[173]	4.13[79] .30[173]	4.60[79] .30[173]	4.80[79] .30[173]	....
NY, New York	3.45[211] .276[154]	3.45[211] .60[154]	4.80*†[212] .60[155]	4.55*[211] .364[154]	4.60*[213] .652[156]	4.60*[212] .652[156]	4.80*†d .432[157]	3.80†[211] .304[158]	4.70*g[214] .67[159]	4.60*†[215] .368[160]	4.05*d .365[161]	4.65*†[211] .372[154]	4.65*†[211] .372[154]	4.15g 1.415[162]	4.10*†[216] 3.69[163]	4.25*†[217] .683[164]	4.45*†d .721[165]	4.65*†[220] .6045[166]	4.60*d 3.68[167]	4.60d 3.68[167]	4.65*†[218] .572[168]	‡	2.35* .265[1]	5.05*[211] .404[154]	4.175*[211] .334[154]	4.80*[211] .384[154]	4.30*†[211] .344[154]	3.90*†[211] .195
Pa, Harrisburg	2.35[59] .035[4]	2.35[59] .035[4]	3.875*[59]	3.355*[59] .035[4]	4.50*[50] .24[78]	4.45*[111] .24[78]	3.875*[59]	2.475*[59] .035[4]	3.650*[152] .035[4]	3.675*	2.675*	3.450*[59] .035[4]	3.650*[152] .035[4]	3.625[153] .3625[4]	2.90[154]	2.91*[155] .06[4]	3.57*[156] .13[4]	3.57[156] .13[4]	2.80*[153] .035[4]	2.80* .035[4]	3.45*[163]	‡	2.385* .10[78]	4.225* .20[78]	3.63* .10[78]	3.935 .20[78]	3.56* .10[4]	2.475[59] .035[4]
Pittsburgh	2.55 .20[7]	2.725* .20[7]	4.45*[40] .20[7]	3.975*[41] .20[7]	4.30* .20[7]	4.125* .20[7]	4.45* .20[7]	2.05[40] .30[24]	4.225* .20[7]	4.15* .20[7]	4.05* .10[4]	4.10[40] .30[24]	4.225* .20[7]	4.60 .345[4]	3.70 .125[4]	3.70* .10[1]	4.15* .20[7]	4.15## .20[7]	3.80* .20[7]	4.275* .20[7]	4.125 .20[7]	3.12 .20[7]	2.59 .20[7]	3.92 .20[7]	3.92 .20[7]	3.40 .20[7]	3.43 .20[7]	2.60 .20[7]
Philadelphia	2.55# .10[1]	2.60# .15[71]	4.25*[154] .17[1]	3.885* .10[1]	4.30*d .23[72]	4.30*d .23[72]	4.25*[154]	2.60* .15[1]	4.15* .20[1]	3.905*d	3.825* .15[1]	3.875* .15[78]	4.025* .275	4.375* .163[75]	3.375* .225[76]	3.65*[102]	4.10*[57] .415[1]	4.20*[57] .315[1]	3.85*[112] .225[76]	3.60* .225[76]	4.135* .20[42]	3.655* .10[1]	2.45# .15[77]	4.345# .10[1]	3.63# .10[1]	4.055# .10[1]	3.51# .10[1]	2.55# .15[78]
SOUTH																												
Ala, Birmingham	1.95	1.85	3.95[81]	3.15	3.65 .10[5]	3.65 .10[5]	3.95[81]	1.90[81]	3.27[81]	3.35	3.35	3.13[81]	3.05[81]	3.775	3.00	3.05	3.58 .10	3.58 .10	2.80[82]	2.80	3.55 .075[1]	‡	1.90[81]	3.18[83]	3.18[83]	3.18[83]	2.77[83]	2.05[81]
Fla, Jacksonville	....	1.30*	3.60*	3.15*	3.575* .075[1]	3.425*[84] .075[1]	3.60*	1.40*	3.35*[85]	3.45*	3.45*	2.80*	3.35*[86]	3.65 .0365[2]	2.90	2.80	3.65*[87] .15[40]	3.65*[87] .15[40]	3.25*	3.25*	3.55*	‡	1.50	3.30	3.10	3.10	2.10	2.10
Ga, Atlanta	2.00	2.00	4.00*	3.35	3.60[210] .075[4]	3.60 .075[4]	4.00	4.00 .04[2]	3.50 .03[178]	3.65	3.65	3.35	3.50 .03[178]	4.00 .0425[178]	3.30	3.00	3.85 .225[178]	3.85 .22½[158]	2.90	2.90	3.65[47]	‡	2.10	3.675	3.15	3.675	3.575	2.22
Ky, Frankfort	2.525	2.375	3.975[35] .075[4]	3.45	3.75 .10[4]	3.75 .10[4]	3.975 .075[4]	2.70[36]	3.50	3.50	3.50	2.80[36]	3.50	3.85 .075[4]	3.325	3.02	3.75 .075[48]	3.75 .075[48]	2.90	2.85	3.625 .075[1]	3.75 .10[1]	2.85	3.525	2.80[37]	3.525	2.80	2.80[37]
Louisville	2.575[78]	2.575[78]	3.975[207] .075[4]	3.575	3.75 .10[4]	3.75 .10[4]	2.575 .075[56]	2.80	3.60[208] .05[57]	3.50	3.50	3.60[36]	3.60	3.85[209] .075[4]	3.325	3.08[142]	3.75 .075[4]	3.75 .075[4]	2.90	3.50	3.625 .075[4]	‡	2.85[78]	3.15[50]	3.15[50]	3.15[50]	....	....
La, N. Orleans	1.875#[194]	1.875#[194]	3.675#[194] .075[1]	3.25*[194]	3.55*[194] .10[1]	3.55*[194] .10[1]	3.675*[194] .075[1]	1.975*[194]	3.27*[195] .08[15]	3.25#	3.25#	3.10#[196]	3.275*[197] .08[15]	3.90[198] .075[1]	2.875*[199]	3.15*[200] .075[1]	3.70*[163] .15[16]	3.70*[163] .15[16]	3.20*[154] .075[1]	3.675*[194] .075[1]	3.36*[154] .075[1]	3.36*[154] .075[1]	3.375*[194] .075[1]	3.375*[194] .075[1]	3.375*[194] .075[1]	3.375*[194]	2.70*[201] .075[1]	1.975#[202]
Miss, Jackson	1.50#	1.50#		3.00#[44]	3.30#[45]	3.05[46]			3.00			2.85##[47]	3.00*	3.40#	3.25		3.65*	3.65*	2.30#	2.30#	3.35*[48]	3.15*[49]	1.975b	3.15[49]	2.80[50]	2.80[50]	2.30[47]	1.60
Tenn, Nashville	1.55[16]	1.75[161]	3.80*	3.20*	3.40*	3.30*	3.80*[160]	1.85	3.50*	3.80*[160]	3.80*[160]	2.90	3.30*	3.425 .134[32]	3.10[162]	2.95[163]	3.70*[164] .10[4]	3.70*[164] .10[4]	2.75[165]	2.75[165]	3.25*[91]	‡	2.10	3.10*	2.80*	2.65*	2.25*	1.90
W.Va, Charleston	2.55	2.525 .075[1]	4.00	3.775	3.80 .10[1]	3.80 .10[1]	4.00	2.675	3.625	3.50	3.50	3.60	3.725	3.675 .075[1]	3.125	....	3.775	3.775	3.775	3.775	3.775	‡	2.625	3.75	3.20	3.40	2.50	2.675
MIDDLE WEST																												
Ill, Chicago	3.025 .075[1]	3.025 .075[1]	4.225*[101] .10[1]	3.91*[28] .20[42]	4.35*[27] .16[49]	4.18* .195[50]	4.225[101] .10[1]	3.025 .075[1]	4.00* .27[1]	3.975*	4.05[102] .13[1]	3.91[102] .20[41]	3.88 .30[1]	4.30[103]	3.75[104] .25[51]	4.04 .20[42]	4.05[102] .30[52]	4.10[102] .25[53]	4.17 .23[54]	4.17 .23[54]	4.10[105] .225[55]	4.10[102] .25[53]	2.58 .175[1]	4.25*[102] .05[1]	3.65*[102] .05	3.90*[102] .05[1]	3.55[4] .05[1]	3.85[102] .05
Mich, Detroit	2.90*[140] .337[83]	2.90*[140] .337[83]	3.98* .3388[84]	3.63*[99] .463[85]	4.00*[141] .275[86]	3.62*[140] .28[87]	3.98*[142] .3388[88]	2.90*[140] .3370[83]	3.75* .38[89]	3.70* .35[90]	3.70* .35[90]	3.47*[99] .3641[91]	3.65* .45[92]	4.00* .52[93]	3.50* .325[94]	3.47* .0694[3]	3.90* .495[95]	3.90* .495[95]	3.865* .25[96]	3.47*[99] .3641[91]	.390* .39[97]	4.00*[111] .275[98]	3.63*[143] .395[176]	3.63*[142] .395[83]	3.63*[142] .395[83]	3.63*[142] .395[83]	3.63*[142] .395[83]	3.03[140] .31[43]
Ohio, Cincinnati	2.80	2.90*	4.025* .12	3.90*	3.95* .105[4]	3.80*[38] .10[4]	4.125	3.27*	3.875* .01[178]	3.65* .10[4]	3.80*	3.775*	3.875* .005[178]	4.09* .511[179]	....	3.80*	3.97* .175[4]	4.10* .095[4]	3.77*	....	3.96*	....	2.65[39] .0625[4]	3.575 .10[4]	3.575 .10[4]	3.575 .10[4]	3.80 .10[4]	3.80 .10[4]
Cleveland	3.285#	3.37#	4.085*[177] .10[1]	4.11*	4.01* .10[1]	4.01* .10[1]	4.085* .10[1]	3.37*	4.11*	3.875* .10[1]	3.935*	4.11*	4.11a	4.17a[42]	3.725a .21[180]	3.86a .25[181]	4.01a .10[1]	3.91a .20[119]	4.11a	4.11a	4.11a	4.11a	2.92 .15[1]	4.11a	3.86a	4.11a	3.735a	3.735a
Columbus	2.70	2.70	4.06* .01[21]	3.61* .01[21]	3.90* .11[22]	3.90* .11[22]	3.505[68]	2.51	3.70* .04[23]	3.505[68]	3.565	3.45	3.70* .04[23]	3.80[20] .038[2]	3.30	3.07[69]	3.825*[70] .075[1]	3.825* .075[1]	3.635 .10[1]	3.81 .10[1]	3.70[71] .10[1]	3.575	2.70	3.80* .10[1]	3.575c .10[1]	3.80 .10[4]	3.80 .10[4]	3.80 .10[4]
Toledo	2.98*[166] .10[4]	3.03*[166] .10[4]	4.02*[166] .10[4]	3.91*[166] .10[4]	3.91*[166] .10[4]	3.88*[166] .10[4]	4.02*[166] .10[4]	3.16*[166] .10[4]	3.87*[167] .10[4]	3.87*[166] .10[4]	3.91*[166] .10[4]	3.91*[166] .10	3.87*[167] .10[4]	4.00*[166] .08[4]	3.63*[166] .10[4]	3.50*[166] .10[4]	3.95*[169] .10[4]	3.95*[169] .10[4]	3.75[166] .10[4]	3.75*[165] .10[4]	3.75*[166] .10[1]	‡[166]	3.08*[165] .10[1]	3.91*[135] .10[4]	3.65*[168] .10[4]	3.77*[168] .10[4]	3.495*[168] .10[4]	3.495*[168] .10[4]
Wis, Milwaukee	2.79[157] 0.30[41]	2.79[157] .30[41]	3.82[157] .30[41]	3.57[158] .30[41]	3.67[157] .20[42]	3.67[157] .20[42]	3.82[157] .30[41]	2.90[157] .30[41]	3.55[157] .30[41]	3.63 .254[43]	3.57[157] .298	3.40[157] .30[41]	3.65[157] .20	3.73 .30[46]	3.32[157] .30[41]	3.45[159] .239[47]	3.68[157] .30[41]	3.68[157] .30[41]	3.38[157] .30[11]	3.38 .30[11]	3.59 .30[41]	3.67[157] .20[42]	2.70[112]	3.735[112] .20[42]	3.59[112] .20[42]	3.405[112] .20[42]	3.13[112] .20[42]	3.01[157] .30[41]
WEST OF MISSISSIPPI																												
Colo, Denver	2.32	2.32	4.00*	3.60*[48]	3.66*[106] .10[4]	3.66*[106] .10[4]	4.00*	4.00*	3.75*[107] .125[17]	3.80*[108]	3.80*[108]	3.54	3.75*[107] .075[4]	4.05 .162[3]	3.25	3.17[109]	3.95 .10[4]	3.95 .10[4]	3.45[110] .10[4]	3.45*[110] .10[4]	3.90*[11] [18]	‡	2.60	3.25	3.10	3.10	3.10	2.60
Kans, Topeka	2.22	2.35#	3.85*	3.25#	3.775*	3.625*	3.85*	2.35*	3.65*	3.85*	3.225*	3.375#	3.50*	3.90#	3.10#	3.30*	4.00#	4.00#	3.10# .10[4]	3.05#	3.43* .075	3.175*	2.675*	3.70*	2.45*	3.30*	2.90	2.90
Minn, St. Paul	2.85[128]	2.85[129]	3.875*[129] .15[4]	3.45[130] .15[4]	3.62*[131] .15[4]	3.62*[131] .15[4]	3.55*[129] .15[4]	2.95[129]	3.60* .38[66]	3.55[132] .38[8]	3.39[129] .12[67]	3.55[129] .15[4]	3.55 .38[66]	3.65 .475[68]	3.30[133] .15[4]	3.20	3.62*[134] .35[69]	3.62* .35[69]	3.45 .15[3]	3.45 .15[3]	3.45[135] .42	2.85	3.67[136]	3.23[137]	3.60[128]	3.62[129]	3.12[128]	3.00[129]
Minneapolis	2.85[128]	2.85[129]	3.875*[129] .15[4]	3.45[130] .15[4]	3.62*[131] .15[4]	3.62*[131] .15[4]	3.45*[129] .15[4]	2.45[129]	3.60*[40] .33[86]	3.55[132]	3.39[129] .12[4]	3.55[129] .15[4]	3.65 .33[36]	3.70[67] .444[37]	3.39[133] .12[3]	3.20[4]	3.62*[134] .35[38]	3.62[134] .35[38]	3.45 .15[3]	3.45 .15[3]	3.57[139] .25[39]	‡	2.85[136]	3.67[137]	3.23[128]	3.60[129]	3.12[128]	3.00[129]
Duluth	2.62[171] .075[4]	2.62[171] .075[4]	3.82[171]	3.27[164] .075[4]	3.72[154]	3.62	3.82[164]	2.72 .075[4]	3.575 .075[4]	....	3.355[172]	3.27[171] .075[4]	3.475 .075[4]	3.65 .383[109]	3.20[173] .075[4]	....	3.63[189] .1576[110]	3.63[189] .1576[110]	3.35[174] .175[112]	....	3.395[175] 2.75[113]	‡	2.74[176] .19[114]	....	....	....	....	....
Mo, Kansas City	2.63[178]	2.58#[178]	4.075*[178]	3.625*[178]	3.775*[178]	3.625*[178]	3.80*[179]	2.675*[178]	3.875*[178]	3.925*[180] .143[1]	3.925*[180] .143[1]	3.625*[178]	3.60*[181]	3.75*[182] .3525[79]	3.55#[178]	3.715*[183]	3.95# .09[80]	3.80# .095[81]	3.20#[184] .10[1]	3.20[184] .10[1]	3.75*[48] .195[82]	‡	2.555[178]	3.57[181]	3.325[181]	3.325[181]	3.325[181]	2.675[178]
St. Louis	2.875[144] .10[1]	2.875[144] .10	4.05* .323[58]	3.825*[144] .10[1]	3.85*[144] .075[1]	3.85*[144] .075[1]	4.05* .323[58]	3.15* .10[1]	4.00*[44] .075[3]	4.00*[145]	3.725* .261[59]	3.975*[146] .20[41]	3.90*[44] .175[60]	4.11*[147] .5055[61]	3.69* .125[61]	4.05*[148] .291[62]	4.15* .325[63]	4.275*[149] .25[64]	4.00*	4.05* .323[58]	4.04* .3366	3.85*[144] .075[1]	3.10*[150] .15[1]	3.95*[151]	3.95*[151]	3.40*[151]	3.40*[151]	3.40*[151]

Building Trades Wage Rates—*continued*

	Common Labor		Skilled Trades																				Equipment Operators					
	Heavy	Bldg	Bricklayer	Carpenter	Ironworker Struc	Ironworker Reinf	Stone Mason	Mason's Helper	Plasterer	Mosaic & Terr	Tile Layer	Cement Finisher	Lather	Electrn Inside	Painter	Glazier	Plumber	Steamfitter	Roofer	Waterproofer	Sheet Metal Wkr	Welder	Truck Dr 1½ T	Shovel Oper	Tractor Oper 30 hp	Hoist Engr 1-Dr	Air Comp	Air Tool
Mont, Billings	2.57	2.57	3.75*	3.15[93]	3.70#[94]	3.70*[94]	3.75*	2.87*	3.30[95]	3.05[96]	3.50*	3.20[95]	3.25	3.50[97] .035[182]	3.05[98]	2.97	3.60*[38]	3.60*[38]	2.90	2.90	3.40 .10[4]	3.65*	2.61[99]	3.155[100] .075[4]	3.155[100] .075[4]	2.935[100] .075[4]	2.705[100] .075	2.82
ND, Bismarck	1.86	1.86	3.60	2.72	3.60	3.60	3.60	1.95	3.02	....	3.10	2.80	3.00	3.10	2.40	2.40	3.05	3.05	2.70	2.70	2.60	‡	2.17	3.37	2.32	3.15	2.82	2.12
Okla, Okla City	....	2.35	4.00*	3.275[13]	3.50*	3.50*	4.00*	2.50	3.625*	3.55*	3.55*	3.35	3.625*	3.75*	3.10	3.75	3.85*	3.85*	3.10	3.10	3.50 .05[1]	3.50	2.50	3.25	2.775	3.25	2.775	2.50
Tulsa	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Tex, Austin	1.55[72]	1.45[72]	4.00*	3.175[73]	3.475*[74] .075[102]	3.225*[75] .075[102]	4.00	1.70[72]	3.625*	3.50*	3.50*	3.225[75]	3.625*	3.50b	2.875[76]	2.45	3.55[77]	3.55	2.40	....	3.625[78]	‡	1.50	3.525*[79]	3.525*[79]	3.525*[79]	3.15*[80]	1.55[72]
Dallas	1.85	1.85	4.10*[47]	3.45*[48]	3.55 .075[1]	3.55 .075[1]	4.10*	3.075*	3.75* 0.13[99]	3.25*	3.25*	3.35#[170]	3.75* .10[1]	3.625# .075[178]	3.00	3.00	3.70# .085[100]	3.70# .085[100]	2.75	2.85[219]	3.625# .10[1]	3.70 .085[100]	....	3.50	2.50	3.225	....	....
Ft. Worth	1.85	1.85	4.15*	3.35*	3.55* .075[1]	3.30* .075[1]	4.15*	1.95	3.75* .125[1]	3.4375*[125]	3.4375*[125]	3.35#	3.75# .125[1]	3.625 .075[1]	3.125#	3.00	3.675#[123]	3.675#[123]	2.85[127]	2.85[127]	3.625# .10[1]	3.55* .075[1]	2.075#	3.60*	3.60*	3.60*	3.20*	2.00
FAR WEST																												
Ariz, Phoenix	2.71[24]	2.71[24]	4.10*[25] .25[135]	3.775[26] .10[4]	4.10* .225[136]	3.85* .225[136]	3.94 .23[137]	2.81 .23[137]	4.165[26] .10[4]	4.39	3.94 .23[137]	3.72[27] .10[4]	4.16*[28]	4.20[29]	3.35[30] .115[1]	3.29[31]	4.25*[31] .20[134]	4.25* .20[134]	3.47	....	4.10[32]	‡	2.835[27] .10[4]	3.945[33] .10[4]	3.715[31] .10[4]	3.515[28] .10[4]	2.995[23] .10[4]	2.965[2] .10[4]
Los Angeles	3.08[23] .10[4]	3.08[22] .10[4]	4.20*[53] .25[115]	3.825* .2025[116]	4.075*[53] .23[117]	3.825*[56] .23[117]	4.20*[57] .25[115]	3.33[58] .10[4]	4.25*[59] .425[118]	3.93[63]	4.20[52] .22[131]	3.85[51] .10	4.125*[62] .55[132]	4.65* .0485[2]	3.73[32]† .125[4]	3.755[64] .075[1]	4.33*[65] .6495[123]	4.33*[65] .6495[123]	3.60 .20[133]	3.90 .20[133]	4.05 .372[131]	‡	3.365[66] .10[4]	4.21[67] .20[123]	4.11[67] .20[123]	3.81[67] .20[123]	3.33[67] .20[123]	3.29[53] .10[4]
San Diego	3.08[113] 0.75[4]	3.08[113] .075[4]	4.35*[53] .175[111]	3.825*[114] .20[119]	3.85*[115] .225[120]	3.60*[115] .225[121]	4.35*[53] .175[120]	3.38[23] .175[121]	4.225*[116] .155[122]	4.00[117] .03[123]	4.00[117] .03[123]	3.93[118] .10[4]	4.225*[113] .155[122]	4.35*[120] .1435[124]	3.72[121] .20[119]	3.755[122] .1489[125]	4.33*[123] .6495[123]	4.33*[123] .6495[123]	4.35 .10[4]	4.35 .10[4]	4.10[35] .3593[127]	‡	3.335[33] .10[4]	4.21[124] .20[123]	4.11[124] .20[123]	3.81[124] .20[123]	3.33[124] .20[128]	3.29[113] .075[4]
San Francisco	3.045#[11] .10[1]	3.045#[11] .10[1]	4.40* .425[139]	3.725*[12] .36[140]	4.275*[13] .255[141]	4.025*[13] .255[141]	4.40* .425[139]	....	3.79 .63[142]	4.40* .425[139]	3.75* .345	3.77[14] .20[12]	3.79* .63[142]	4.38*[15] .195[144]	3.67[16] .345[145]	3.56 .16[146]	4.33*[17] .72[148]	4.33*[17] .72[148]	3.90 .25[147]	3.90 .25[147]	3.85 .355[143]	3.03 .03[2]	3.19[18] .11[1]	4.31[19] .28[149]	4.01[20] .28[149]	3.80[21] .28[149]	3.48[22] .28[149]	3.475 .10[1]
Idaho, Boise	2.55[4] .075[4]	2.55[4] .075[4]	3.85*[4]	3.25[102] .075[4]	3.55*[4] .075[4]	3.55*[4] .075[4]	3.85*[4]	2.95[48] .075	3.00	3.85*[4]	3.85*[4]	3.35[18]	3.00	3.75*	3.00f	3.00f	3.70*[103] .14[3]	3.70 .14[3]	3.03[112]	....	3.25f	3.30[1] .075[1]	2.85[1] .075[1]	3.60[1] .075[1]	3.30[1] .075[4]	2.90[1] .075[4]	2.90[1] .075[4]	2.75[1] .075[1]
Ore, Portland	2.75# .20[119]	2.79*[1] .20[119]	4.07*[2] .23[150]	3.46* .10[4]	3.76*[3] .10[4]	3.56*[3] .10[4]	4.07* .23[150]	3.20*[4] .20[119]	3.78*[4] .12[4]	3.75[5] .13[4]	3.575#[6] .23[150]	3.48#[1] .10[4]	3.745*[7] .10[4]	3.95*[8] .10[4]	3.40#[9] .10[4]	3.625# .10[4]	3.98*[10] .10[1]	3.93[10] .10[1]	3.55#[1] .10[4]	3.55# .10[4]	3.75# .25	....	3.25# .175	3.93# .20[119]	3.61# .20[119]	3.51# .20[119]	3.39# .20[119]	2.95# .20[119]
Utah, Ogden	2.275	2.275	3.95	3.30[177]	3.575 .075[4]	3.575 .075[4]	3.95	2.875	3.625 .10[1]	3.25	3.25	3.15	3.75 .10[4]	3.72 .01[1]	3.10 .09[4]	3.10	3.695 .105[4]	....	3.10 .075[4]	3.415 .075[4]	3.41 .165[104]	3.10 .165[104]	3.10 .075[4]	3.10 .10[4]	3.075 .10[4]	2.775 .10[4]	3.65 .10[4]	....
Salt Lake	2.275	2.275	3.95	3.30[177]	3.575 .075[4]	3.575 .075[4]	3.95	2.875	3.625 .10[1]	3.25	3.25	3.15	3.75 .10[4]	3.72 .01[1]	3.10 .09[4]	3.10	3.645 .105[4]	....	3.10 .075[4]	3.415 .075[4]	3.41 .165[104]	3.10 .165[104]	3.10 .075[4]	3.10 .10[4]	3.075 .10[4]	2.775 .10[4]	3.65 .10[4]	....
Wash, Seattle	3.00[4] .10[4]	3.00[4] .10[4]	4.15*[1] .30[83]	3.38*[88] .20[130]	3.76*[88] .10[4]	3.76* .10[4]	4.15[4] .10[4]	3.30* .10[4]	3.72* .305[105]	3.90* .10[4]	3.90* .10[4]	3.67*[89]	3.72* .306[106]	3.95* .27[107]	3.465[4] .12[4]	3.51*[90] .10[4]	3.89* .27[108]	3.89* .27[108]	3.62[1]	3.87[1]	4.025*[91] .25[30]	4.15[92] .15[129]	3.40* .20[130]	4.18* .20[130]	3.81* .20[130]	3.84* .20[130]	3.54* .20[130]	3.20*[23] .10[4]

•†7 hr day •*double time for O.T. •‡Same as craft doing work

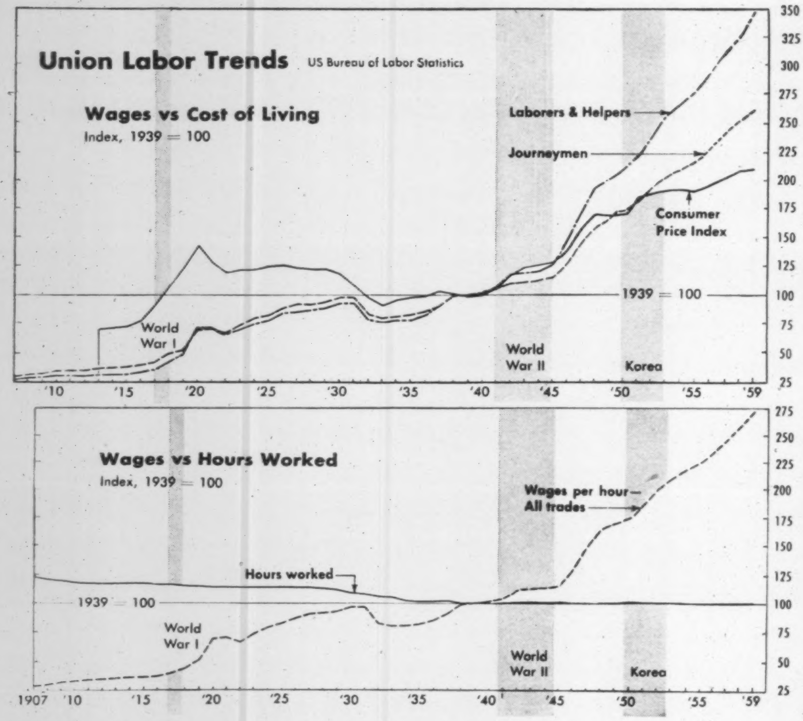
W welfare fund, P pension fund, V Vacation fund, H health insurance or health & welfare fund, A apprentice training fund, PR promotion fund (industry or trade), N contributions to union's national fund, E educational fund, HL paid holiday fund, U unemployment fund, I insurance fund, S Social Security paid by contractor, F unspecified fringe benefits, SV savings or trust fund, J joint board contribution, AN annuity or retirement fund

•† 7 hr day •‡ same as craft doing work •* double time for OT •# double time weekends and holidays •a double time after 8 PM •b double time Sunday and holidays •c employer carries liability insurance •d currently negotiating new contract •e currently on strike •f no overtime •g 6 hr day

BENEFITS/hr •[1] W •[2] P •[3] V •[4] H •[5] 8¢ W, 2¢ A •[6] 15¢ P, 15¢ H •[7] 10¢ H, 10¢ P •[8] 15¢ H, 15¢ P •[9] 15¢ H, 5¢ PR, 25¢ U •[10] 12¢ H, 10¢ P, 3¢ PR •[11] 12¢ H, 10¢ P, 7½¢ PR •[12] 15¢ H, 15¢ P, 2¢ PR •[13] 11¢ H, 15¢ P •[14] 8¢ H, 15¢ P •[15] 5¢ W, 3¢ PR •[16] 7½¢ W, 7½¢ P •[17] 5¢ PR, 7½¢ H •[18] 10¢ V (in base rate) •[19] 12¢ I, 9¢ P •[20] 12½¢ P, 12½¢ I •[21] A •[22] 10¢ W, 1¢ A •[23] 3¢ PR, 1¢ A •[24] 10¢ H, 20¢ P •[25] 5¢ H, 10¢ P •[26] 10¢ H, 7½¢ P, 3¢ A •[27] 10¢ H, 3¢ PR •[28] 7½¢ H, 1% N, •[29] 10¢ H, 2¢ A •[30] 10¢ H, 7½¢ P •[31] 13¢ H, 5¢ E, 10¢ P •[32] 10¢ H, 1% P •[33] 10¢ H, 2¢ PR •[34] 10¢ H, 5¢ A •[35] 1% P ¼/1% E •[36] 10¢ H, 20¢ V, 3¢ P •[37] 11% H&V, 1% P •[38] 10¢ H, 15¢ V, 10¢ P •[39] 10¢ H, 15¢ V •[40] 10¢ W, 5¢ A •[41] 10¢ W, 10¢ V, 10¢ P •[42] 10¢ W, 10¢ P •[43] 7¢ W, 8.4¢ V, 10¢ P •[44] 10¢ W, 9.8¢ V, 10¢ P •[45] 10¢ W, 10¢ V •[46] 10.3¢, 16¢ V, 3.7¢ P •[47] 7¢ W, 6¢ V, 10¢ P •[48] W&I •[49] 7½¢ W, 7½¢ P, 1¢ A •[50] 10¢ W, 7½¢ P, 2¢ A •[51] 15¢ W, 10¢ P •[52] 15¢ W, 15¢ P •[53] 10¢ W, 15¢ P •[54] 13¢ W, 10¢ P •[55] 7½¢ W, 15¢ P •[56] H •[57] PR •[58] 12¢ W&V •[59] 5% F, 7½¢ W, 5% V •[60] 7½¢ W, 10¢ P •[61] 10¢ W, 47¢ V, 1% P, 20¢ V&A •[62] 11¢ W, 10¢ P, 2% V •[63] 10¢, 10¢ V, 5¢ P, 2½¢ E, 5¢ PR •[64] 13¢ W, 12¢ P •[65] 10¢ P, 7½¢ W, 4% V •[66] 15¢ H, 20¢ V, 3¢ PR •[67] 12¢ H, 5¢ HL, 2¢ V •[68] 12% H, 1% P •[69] 10¢ H, 15¢ V, 10¢ P •[70] 10¢ H, 22¢ V, 10¢ P •[71] 10¢ H, 5¢ PR •[72] 15½¢ W, 7½¢ P •[73] 10¢ H, 5¢ PR •[74] 17½¢ PR, 10¢ P •[75] 10¢ W, 4.2¢ P, 2.1¢ A •[76] 12½¢ W, 10¢ P •[77] 7½¢ W, 8¢ P •[78] 10¢ W, 5¢ PR •[79] 4½¢ A, 10¢ W, 17½¢ V, 1% P •[80] 7½¢ W, 1½¢ E •[81] 7½¢ W, 2¢ E •[82] 7½¢ W, 2¢ E, 10¢ Vac •[83] 10¢ V, 10¢ I, 5¢ HL, 3% P •[84] 10¢ I, 4% P, 2% HL •[85] 10¢ I, 4% V, 2% HL, 4% P •[86] 15¢ H, 5¢ V, 7½¢ P •[87] I •[88] 10¢ V, 10¢ I •[89] 13¢ H, 4% V, 10¢ P •[90] 10¢ H, 11¢ V, 4¢ HL, 10¢ P •[91] 10¢ V, 6¢ HL, 10¢ I, 3% P •[92] 10¢ H, 25¢ V&HL, 10¢ P •[93] 10¢ H, 10¢ P, 1% N •[94] 12½¢ H, 12½¢ V, 7½¢ P •[95] 9¢ H, 23¢ V&HL, 11½¢ P •[96] 12½¢ H, 12½¢ V •[97] 3% H, 4% V, 3% P •[98] 10¢ H, 5¢ V, 12½¢ P •[99] $4 Wk P, $3 Wk H •[100] 7½ W, 1¢ A •[101] 7½¢ W, .01 A •[102] 7½ W, 25¢ Travel over 40 mi •[103] 8¢ W, 1% P, 1/10% A •[104] 10¢ H, 6½¢ V •[105] 12¢ H, 18½¢ V •[106] 12¢ H, 18.6¢ V •[107] 7½¢ H, 16¢ V, 3½¢ P •[108] 10¢ H, 17¢ V •[109] A&H •[110] 1¢ A, 7½¢ H, 2% V •[111] 7½¢ H, 10¢ P •[112] 7½¢ H, 10¢ V •[113] 20¢ V, 7½¢ H •[114] 7½¢ H, 5½¢ V, 6¢ HL •[115] 22¢ H, 3¢ P •[116] 10¢ H, 10¢ P, ¼¢ A •[117] 12½¢ H, 10¢ P, ½¢ A •[118] 15¢ H, 10¢ P, 12½¢ V •[119] 10¢ H, 10¢ P •[120] 12½¢ H, 10¢ P •[121] 7½ ¢H, 10¢ F •[122] 12½¢ H, 3¢ PR •[123] PR •[124] 10¢ H, 1% P •[125] 7½¢ H, 7.48¢ HL •[126] 17.32¢ H, 10.83¢ P, 32.48¢ V, 4.33¢ A •[127] 11¢ H, 10¢ P, 14.93¢ V •[128] 15¢ H 5¢ P •[129] 10¢ H, 5¢ P •[130] 10¢ H, 10¢ P •[131] 12¢ H, 10¢ V •[132] 15.75¢ H, 10¢ P, 25¢ V, 3.75¢ PR, ½¢ A •[133] 10¢ H, 10¢ SV •[134] 11¢ H, 10¢ P, 16.2¢ V •[135] 12½¢ H, 10¢ P •[137] 20¢ H, 3¢ SV •[138] 12½¢ H, 7½¢ A •[139] 17½¢ W, 20¢ P, 5¢ •[140] 10¢ P, 11¢ W, 15¢ V •[141] 15¢ W, 10¢ P, 5¢ A •[142] 15¢ W, 25¢ V, 20¢ P, 3¢ PR •[143] 10¢ W, 5¢ J, 14¢ V, 10¢ P •[144] 10¢ W, 5¢ PR, 4½¢ P •[145] 14½¢ W, 10¢ P, 10¢ V •[146] 7½¢ W, 8½¢ V •[147] 2¢ A, 7½¢ H, 15¢ W, 19¢ V, 12½¢ P, 16¢ HL •[148] 10¢ W, 10¢ P, 15½¢ V •[149] 10¢ W, 10¢ P, 8¢ V •[150] 13¢ H, 10¢ P •[151] 10¢ H, 15¢ V •[152] 7½¢ H, 10¢ P •[153] 10¢ AN, 7½¢ H, 5¢ E •[154] 4% W, 4% P •[155] 5% W, 20¢ P, 15¢ V, 1¢ PR •[156] 10¢ lieu of pd hol, 5% W, 3% P, 3% F, 1% V •[157] 9% W •[158] 5% W, 3% P •[159] 35¢ W, 30¢ P, 2¢ PR •[160] 3% W, 5% P •[161] 3% P, 3% W, 3% V •[162] 5% W&P, 1% N, $4 wk AN, 3% SS •[163] 9% W&P •[164] 4% W, 5% P, 20¢ V, 10¢ HL •[165] 16.2% F •[166] 4% W, 4% P, 5% V, •[167] 3% W, 3% P, 2% V •[168] 3% + 10¢ W, 3% P, 2% + 10¢ V •[169] 5% HL •[170] 11¢ W, 19¢ P •[171] 15½¢ W, 7½¢ P •[172] 10¢ W, 15¢ P, 1% N •[173] 10¢ W, 20¢ P •[174] 15¢ W, 10¢ P •[175] 10¢ W, 13¢ P •[176] $4 wk P, $3 wk H •[177] 10¢ H, 2¢ PR •[178] F •[179] 1% P, ¼% E •[180] 12¢ I, 9¢ P •[181] 12½¢ P, 12½¢ I •[182] 1% N •[183] 10¢ H, 20¢ P

DEFERRED INCREASES (All are base rate increases except as specified. Some base increases raise fringe benefits.) •[1] 1/1/61, 16¢ •[2] 4/1/61, 17¢ •[3] 4/8/61, 16¢ •[4] 1/1/61, 15¢ •[5] 4/1/61, 17¢ •[6] 10/11/60, 10¢; 4/11/61, 15¢ •[7] 1/1/61, 19¢ •[8] 1/1/61, 20¢ •[9] 1/1/61 18¢ •[10] 9/1/60, 10¢ •[11] 5/1/61, 18¢ •[12] 6/1/61, 22½¢ •[13] 8/16/61, 22½¢; 10¢ fr •[14] 5/1/61; 1¢ fr •[15] 6/1/61, 17¢ •[16] 7/1/61, 25¢ •[17] 7/1/61, 21¢, 6¢ fr •[18] 7/1/61, 19¢ •[19] 10/1/60, 7¢; 7/1/61, 23¢ •[20] 10/1/60, 7¢; 7/1/61, 22¢ •[21] 10/1/60, 7¢; 7/1/61, 20¢ •[22] 10/1/60, 7¢; 7/1/61, 19¢ •[23] 5/1/61, 18¢ •[24] 6/1/61, 20½¢ •[25] 6/1/61, 30¢ •[26] 6/1/61, 23¢ •[27] 6/1/61, 20¢ •[28] 6/1/61, 17¢ •[29] 6/20/61, 30¢ •[30] 6/1/61, 10¢; 12/1/61, 10¢ •[31] 12/1/60, 10¢; 6/1/61, 15¢ •[32] 6/16/61, 20¢ •[33] 6/1/61, 31¢ •[34] 6/1/61, 27¢ •[35] 7/1/61, 10¢ •[36] 6/30/61, 10¢ •[37] 7/1/61, 22½¢ •[38] 11/1/60, 5¢ •[39] 6/1/61, 5¢ •[40] 12/1/60, 5¢ •[41] 12/1/60, 15¢ •[42] 5/1/61, 12¢ •[43] 1/1/61, 10¢ •[44] 7/1/61, 10¢ •[45] 1/1/61, 5¢; 7/1/61, 2½¢ •[46] 1/1/61, 5¢; 7/1/61, 7½¢ •[47] 7/1/61, 5¢ •[48] 1/1/61, 5¢ •[49] 1/1/61, 5¢; 7/1/61, 10¢ •[50] 7/1/61, 10¢ •[51] 3/1/61, 15¢ fr •[52] 6/1/61, 20¢ fr •[53] 5/1/61, 15¢ fr •[54] 9/1/60, 12½¢ •[55] 10/1/60, 10¢; 4/1/61, 10¢; 10/1/61, 10¢ •[56] 8/16/60, 20¢, 2½¢ fr; 8/16/61, 22½¢, 10¢ fr •[57] 5/1/61, 15¢ •[58] 5/1/61, 18¢ •[59] 5/1/61, 12½¢ •[60] 7/1/61, 17¢ •[61] 5/1/61, 12½¢ •[62] 5/1/61, 12½¢ •[63] 1/1/61, 8¢; 1/1/61, 7¢ fr •[64] 1/1/61, 7¢ •[65] 7/1/61, 25¢, 3.75¢ fr •[66] 5/1/61, 21¢ •[67] 6/1/61, 20¢, 5¢ fr •[68] 10/31/60, 60¢ •[69] 12/1/60, 5¢ •[70] 12/1/60, 2½¢; 6/1/61, 12½¢; 12/1/61, 2½¢ •[71] 11/1/60, 5¢; 5/1/61, 12½¢; 11/1/61, 5¢ •[72] 1/1/61, 5¢; 7/1/61, 5¢ •[73] 1/1/61, 5¢, 7/1/61, 12½¢ •[74] 1/1/61, 14½¢ •[75] 1/1/61, 14¢; 7/1/61, 23½¢ •[76] 6/1/61, 6¼¢; 6/1/62, 6¼¢ •[77] 7/1/61, 15¢; 7/1/62, 15¢ •[78] 7/1/61, 12½¢ •[79] 7/1/61, 15¢ •[80] 7/1/61, 7½¢ •[81] 9/1/60, 10¢ •[82] 12/1/60, 5¢ •[83] 3/1/60, 12¢ •[84] 11/1/60, 5¢ •[85] 8/18/60, 15¢ •[86] 8/1/60, 15¢ •[87] 10/28/60, 15¢ •[88] 4/20/61, 16¢ •[89] 3/1/61, 18¢; 3/1/62, 17¢ fr •[90] 1/1/61, 8¢ •[91] 10/1/60, 5¢ •[92] 10/1/60, 25¢ •[93] 9/1/60, 5¢; 4/30/61, 15¢; 4/30/62, 15¢ •[94] 10/18/60, 5¢; 6/18/61, 12½¢ •[95] 5/18/61, 15¢ •[96] 2/1/61, 5¢ •[97] 12/1/60, 5¢; 5/1/61, 20¢, 5/1/62, 15¢ •[98] 9/1/60, 5¢ •[99] 5/1/61, 12¢ •[100] 8/15/60, 2½¢; 5/1/61, 15¢ •[101] 6/1/61, 17½¢ •[102] 6/1/61, 15¢ •[103] 6/1/61, 20¢, 3% fr •[104] 4/1/61, 7½¢; 4/1/61, 5¢ fr •[105] 6/1/61, 25¢ fr •[106] 10/1/60, 5¢; 4/1/61, 10¢; 10/1/61, 10¢ •[107] 10/7/60, 5¢; 4/1/61, 10¢ •[108] 1/1/61, 10¢; 7/1/61, 15¢ •[109] 5/13/61, 15¢ •[110] 4/1/61, 10¢ •[111] 7/1/61, 15¢ •[112] 6/1/61, 10¢ •[113] 5/1/61, 20¢ •[114] 5/1/61, 22½¢ •[115] 8/16/61, 17½¢, 2½¢ fr; 8/16/61, 22½¢, 10¢ fr •[116] 5/16/61, 20¢ •[117] 9/1/60, 10¢ •[118] 5/1/61, 20½¢ •[119] 5/16/61, 20¢ •[120] 10/1/60, 25¢, 4.8¢ fr •[121] 7/1/61, 15¢; 1/1/61, 1¢ fr •[122] 1/1/61, 7¢, 7.6¢ fr •[123] 7/1/61, 25¢, 3.75¢ fr •[124] 6/1/61, 20¢, 5¢ fr •[125] 4/1/61, 7¼¢ •[126] 1/1/61, 7½¢ •[127] 7/1/61, 10¢; 7/1/62, 10¢ •[128] 1/1/61, 13¢; 1/1/62, 12¢ •[129] 5/1/61, 15¢; 5/1/62, 10¢ •[130] 9/1/60, 5¢; 5/1/61, 18¢; 5/1/62, 10¢ •[131] 5/1/61, 15¢; 5/1/62, 13¢ •[132] 1/1/61, 8¢ fr; 5/1/61, 15¢; 5/1/62, 10¢ •[133] 5/1/61, 15¢ fr; 5/1/62, 12¢ •[134] 11/1/62, 2¢ fr •[135] 11/1/60, 5¢ •[136] 5/1/61, 13¢; 5/1/62, 12¢ •[137] 1/1/61, 15¢; 1/1/62, 15¢ •[138] 5/1/61, 15¢ fr; 5/1/62, 9¢ •[139] 11/1/60, 7¢ •[140] 5/1/61, 10¢ •[141] 5/1/61, 10¢, 5¢ fr •[142] 5/1/61, 11¢ •[143] 5/1/61, 8¢, $1 wk fr •[144] 11/1/60, 5¢; 5/1/61, 10¢; 11/1/61, 10¢; 5/11/62, 10¢; 11/1/62, 10¢ •[145] 11/1/60, 9¢ •[146] 9/1/60, 5¢ fr; 5/1/61, 10¢, 10¢ fr; 5/1/62, 15¢, 15¢ fr •[147] 8/1/61, 15¢; 8/1/62, 20¢ •[148] 11/1/61, 10¢; 5/1/61, 8.1¢ fr •[149] 6/15/61, 15¢; 6/15/62, 20¢ •[150] 10/1/60, 3¢; 5/1/61, 10¢; 10/1/61, 2¢; 3/1/62, 5¢ fr •[151] 11/1/60, 5¢; 5/1/61, 17½¢; 5/1/62, 10¢; 11/1/62, 10¢ •[152] 5/1/61, 17½¢ •[153] 5/1/61, 12½¢; 5/1/62, 12½¢ •[154] 5/1/61, 15¢ •[155] 1/1/61, 6¢ •[156] 11/1/60, 5¢; 5/1/61, 12½¢; 5/1/62, 12½¢ •[157] 6/1/61, 14¢ •[158] 6/1/61, 24¢ •[159] 1/1/61, 5¢; 6/1/61, 10¢ •[160] 10/1/60, 5¢; 4/1/61, 10¢ •[161] 9/1/60, 15¢ •[162] 5/1/61, 5¢; 11/1/61, 5¢ •[163] 11/1/60, 10¢ •[164] 7/1/61, 5¢, 10¢ fr; 11/1/61, 5¢, 10¢ fr •[165] 8/23/60, 10¢ •[166] 11/1/60, 8¢; 5/1/61, 8¢ •[167] 11/1/60, 5¢; 5/1/61, 10¢ •[168] 11/1/60, 3¢; 5/1/61, 12¢ •[169] 12/1/60, 7¢; 6/24/61, 8¢ •[170] 3/15/60, 10¢ •[171] 5/1/61, 13¢ •[172] 5/1/61, 16¢ •[173] 9/1/60, 5¢ •[174] 11/1/60, 5¢; 11/1/61, 13¢ •[175] 11/1/60, 5¢; 6/1/61, 10¢ •[176] 5/1/61, 3¢ •[177] 1/1/61, 10¢; 6/1/61, 10¢ •[178] 4/1/61, 12½¢ •[179] 4/1/61, 10¢ •[180] 4/1/61, 17½¢ •[181] 4/1/61, 15¢ •[182] 9/10/60, 15¢; 9/10/60, 7.53¢ fr & 5¼% fr •[183] 8/1/61, 15¢ •[184] 6/1/61, 12½¢ •[185] 4/1/61, 2½¢ •[186] 9/31/61, 5¢ fr •[187] 6/1/61, 2½¢ fr •[188] 4/1/61, 7½¢ •[189] 4/1/61, 10¢; 4/1/62, 15¢ •[190] 9/1/60, 2½¢, 25¢ fr; 4/1/61, 7½¢ •[191] 4/1/61, 5¢; 4/1/62, 10¢ •[192] 4/1/61, 20¢ fr •[193] 6/1/61, 7½¢ •[194] 11/1/60, 5¢; 5/1/61, 5¢ •[195] 11/1/60, 7½¢ •[196] 11/1/60, 2½¢; 5/1/61, 5¢ •[197] 11/1/60, 9½¢ •[198] 1/1/61, 10¢ •[199] 4/1/61, 12½¢ •[200] 8/8/61, 10¢ •[201] 11/1/60, 2½¢; 5/1/61, 2½¢ •[202] 11/1/60, 5¢; 5/1/61, 5¢ •[203] 7/1/61, 20¢; 7/1/62, 20¢ •[204] 7/1/61, 15¢; 7/1/62, 20¢ •[205] 7/1/61, 15¢ fr; 7/1/62, 15¢ •[206] 5/1/61, 15¢; 5/1/62, 15¢ •[207] 7/1/60, 7½¢ •[208] 7/1/61, 5¢; 7/1/61, 5¢ •[209] 10/31/60, 5¢; 4/3/61, 10¢ •[210] 3/1/61, 10¢ •[211] 1/1/61, 10¢; 7/1/61, 10¢; 1/1/62, 10¢; 7/1/62, 20¢ •[212] 1/1/61, 20¢; 6/1/61, 20¢ •[213] 1/1/61, 35¢; 7/1/61, 10¢; 1/1/62, 10¢; 7/1/62, 15¢ •[214] 6/23/61, 25¢ •[215] 1/1/61, 8¢ •[216] 10/1/60, 20¢; 10/1/61, 20¢ •[217] 7/1/61, 10¢, 2% fr; 7/1/62, 10¢, 1% fr •[218] 1/1/61, 10¢; 7/1/61, 10¢; 1/1/62, 20¢; 7/1/62, 20¢ •[219] 7/1/61, 10¢; 7/1/62, 10¢ •[220] 7/1/61, 15¢ base, 1% + 10¢ fr; 7/1/62, 20¢ base, 1% fr

How BLS Covers



Construction workers continue to forge ahead of most employees in other industries. Wage rates and hourly earnings of construction workers climb to new highs in 1960. And August employment in contract construction, though not up to the 1956 peak, increased to the second highest ever estimated for the month by the US Bureau of Labor Statistics, 3,184,000.

Hourly earnings in June averaged $3.33 in building construction and $2.91 in other than building. Both were above the $2.29 for manufacturing.

Moreover, construction workers' hourly earnings increased far more than those in manufacturing between June '59 and June '60. Building construction workers upped their earnings by 16 cents per hour, well above the 11-cent rise in the preceding 12-month period. In other-than-building construction, earnings in June were 12 cents more than a year earlier. Average earnings in manufacturing moved up only 5 cents in the year ending June.

BLS Trends in Individual Trades

Wages Per Hour: Indexed based on 1939=100

Year	All Building Trades	Journeymen	Helpers & Laborers	Bricklayers	Carpenters	Cement Finishers	Electricians, Inside Wiring	Glaziers	Lathers	Painters	Plasterers	Plumbers	Sheet Metal Workers	Steamfitters	Stonemasons	Structural Ironworkers	Building Laborers	Bricklayers' Tenders
1907M	29.3	29.7	27.3	37.7	29.8	34.5	27.9	....	....	26.2	37.3	33.3	30.6	30.1	33.9	27.9	30.8	30.3
1913M	36.1	36.9	31.8	41.5	36.8	38.0	33.8	....	34.6	35.5	39.3	37.9	35.6	35.0	36.7	37.3	34.2	31.8
1926M	88.3	88.7	84.9	84.1	88.5	86.6	81.5	80.7	83.0	90.9	92.4	83.9	86.3	84.9	92.7	81.1	86.9	85.5
1930M	97.0	97.5	93.3	101.8	96.9	95.4	90.9	92.6	98.6	100.6	98.1	91.5	94.7	93.5	99.1	92.5	92.9	94.9
1932M	83.1	83.6	79.2	87.0	79.6	83.6	87.9	78.0	80.0	85.3	81.4	80.5	83.4	81.0	88.4	81.0	78.7	78.4
1938J	99.3	99.3	99.2	99.5	99.8	99.6	99.5	99.3	96.8	99.2	99.2	99.1	98.6	99.3	99.7	98.9	99.4	99.7
1942	111.9	110.9	117.5	108.3	112.1	110.8	113.5	108.8	109.1	110.5	105.0	110.5	116.0	109.3	108.0	108.7	119.6	115.7
1946	129.3	126.8	146.3	125.6	129.7	128.2	124.9	123.4	124.2	127.3	119.0	123.2	133.0	124.6	126.5	121.4	152.2	141.7
1949	170.3	166.1	199.8	174.0	169.1	165.8	168.1	160.5	164.2	162.1	161.9	162.8	169.6	161.3	175.7	157.4	208.4	190.4
1950	177.8	173.2	210.8	180.4	177.4	172.7	172.3	169.4	179.6	167.7	169.3	166.7	177.9	168.3	187.1	164.8	220.0	203.4
1951	189.1	184.0	225.3	188.0	189.1	183.7	185.4	177.8	188.0	178.7	177.5	176.6	188.1	178.6	193.6	175.7	235.6	213.9
1952	200.8	195.3	240.0	203.9	200.6	192.2	196.0	186.0	194.4	190.2	187.6	187.0	202.2	189.1	207.5	184.0	251.7	228.0
1953	211.2	204.9	256.6	210.0	211.1	203.8	204.0	199.1	203.4	199.5	194.8	193.8	211.5	197.9	210.9	194.5	270.8	240.0
1954	218.9	212.2	267.7	216.8	217.9	209.7	210.0	204.9	208.7	205.7	198.4	204.5	221.5	208.5	215.7	201.3	282.6	250.4
1955	226.2	219.4	279.1	222.6	225.9	217.9	214.8	214.0	214.2	213.9	204.3	209.4	230.0	213.5	222.1	208.9	295.3	260.6
1956	237.1	229.2	295.9	232.6	235.4	228.4	226.6	225.2	223.3	222.5	212.1	218.7	240.4	223.3	232.1	217.7	312.1	281.2
1957	249.3	240.8	313.2	241.7	247.8	239.9	237.9	236.8	232.7	234.3	219.9	230.8	251.8	235.2	238.8	229.0	331.7	296.0
1958	260.7	251.6	328.4	249.8	259.4	249.9	250.5	248.4	242.6	242.7	226.9	240.5	265.9	247.3	247.7	236.7	348.1	310.5
1959	273.4	263.2	349.2	260.5	272.3	262.3	258.9	260.8	251.0	252.1	234.4	253.5	278.5	258.2	256.0	249.5	371.2	331.8

Hours Worked Per Week: Index based on 1939=100

Year	All Building Trades	Journeymen	Helpers & Laborers	Bricklayers	Carpenters	Cement Finishers	Electricians, Inside Wiring	Glaziers	Lathers	Painters	Plasterers	Plumbers	Sheet Metal Workers	Steamfitters	Stonemasons	Structural Ironworkers	Building Laborers	Bricklayers' Tenders
1907M	124.3	123.8	126.1	122.9	121.0	122.7	124.2	....	....	133.1	125.8	120.6	117.0	120.3	118.4	121.3	121.6	118.9
1913M	118.2	118.0	118.3	114.9	115.6	119.8	120.7	....	121.8	125.9	124.3	119.2	114.9	118.0	115.7	114.1	118.3	116.0
1926M	114.9	115.1	113.9	113.3	113.5	113.4	115.9	117.5	118.9	120.7	118.2	116.5	111.8	114.4	114.5	112.8	112.1	113.9
1930M	109.8	110.0	109.0	107.1	109.4	108.1	109.9	112.4	110.4	115.4	113.0	109.9	106.9	108.5	107.1	108.8	110.0	106.9
1932M	106.5	106.6	105.7	103.1	105.0	105.6	106.2	107.9	109.3	114.2	110.1	108.0	103.6	105.4	104.8	104.8	104.9	104.0
1938J	100.2	100.1	100.2	99.0	100.0	100.0	100.2	100.2	100.8	110.4	100.0	99.7	100.0	99.6	100.1	100.1	100.1	100.3
1942	101.1	101.8	98.8	100.8	100.8	100.6	104.5	102.0	102.5	106.5	102.0	99.9	100.9	102.2	100.2	101.1	98.8	98.6
1946	100.2	101.1	97.5	100.3	103.3	100.4	100.4	102.0	102.2	106.1	104.1	98.3	100.8	101.3	100.0	101.1	97.2	96.9
1949	100.2	101.1	97.4	100.1	100.2	100.0	102.1	103.5	98.1	106.2	103.5	97.6	99.9	101.3	100.8	101.1	97.2	96.4
1950	100.3	101.2	97.4	100.1	100.2	100.0	102.1	103.5	100.2	106.2	105.9	98.2	99.9	101.3	100.8	101.1	97.2	96.4
1951	100.2	101.1	97.3	100.2	100.2	100.0	102.1	103.5	100.2	104.9	105.9	98.2	99.9	101.3	100.9	101.1	97.0	96.2
1952	100.2	101.1	97.5	100.2	100.2	100.0	101.1	103.5	100.2	104.9	105.9	98.2	99.9	101.3	100.9	101.1	97.1	96.3
1953	100.2	101.1	97.5	100.2	100.2	100.0	101.1	103.5	100.3	104.9	105.9	98.2	99.9	101.3	100.9	101.1	97.1	96.3
1954	100.2	101.1	97.5	100.2	100.2	100.0	101.1	103.5	99.8	104.9	105.9	98.2	99.9	101.3	100.9	101.1	97.1	96.3
1955	100.2	101.1	97.5	100.2	100.2	100.0	101.1	103.5	99.8	104.9	105.9	98.2	99.9	101.3	100.9	101.1	97.1	96.2
1956	100.2	101.1	97.5	100.2	100.2	100.0	101.0	103.5	99.8	104.9	105.9	98.2	99.9	101.3	100.9	101.1	97.1	96.2
1957	100.2	101.1	97.5	100.2	100.2	100.0	101.1	103.5	99.8	104.9	105.9	98.2	99.9	101.3	100.9	101.1	97.1	96.2
1958	100.1	101.0	97.5	100.1	100.2	100.0	99.7	103.5	99.8	104.9	105.8	98.2	99.9	101.3	100.7	101.1	97.1	96.2
1959	100.1	101.0	97.5	100.1	100.2	100.0	99.7	103.5	99.8	104.9	106.1	98.2	99.9	101.3	100.7	101.1	97.1	96.2

•M May 1. •J June 1. •All others July 1.

Average Hourly Earnings

US Bureau of Labor Statistics

BUILDING CONSTRUCTION

	1946	1949	1950	1955	1956	1957	1958	1959	1960
Jan	$1.40	$1.92	$1.98	$2.65	$2.74	$2.92	$3.07	$3.19	$3.32
Feb	1.42	1.93	1.99	2.65	2.75	2.91	3.08	3.18	3.33
Mar	1.41	1.93	2.00	2.63	2.75	2.91	3.06	3.17	3.38
Apr	1.42	1.93	1.99	2.63	2.75	2.92	3.06	3.17	3.32
May	1.43	1.93	2.00	2.63	2.76	2.94	3.06	3.17	3.34
June	1.44	1.92	2.00	2.64	2.78	2.94	3.06	3.17	3.33
July	1.47	1.92	2.01	2.66	2.79	2.96	3.09	3.20	....
Aug	1.48	1.93	2.02	2.67	2.81	2.97	3.09	3.23	....
Sept	1.51	1.94	2.07	2.68	2.84	3.02	3.13	3.26	....
Oct	1.53	1.94	2.08	2.70	2.86	3.02	3.13	3.27	....
Nov	1.55	1.95	2.09	2.71	2.87	3.03	3.14	3.28	....
Dec	1.57	1.96	2.12	2.72	2.89	3.05	3.19	3.30	....

OTHER THAN BUILDING

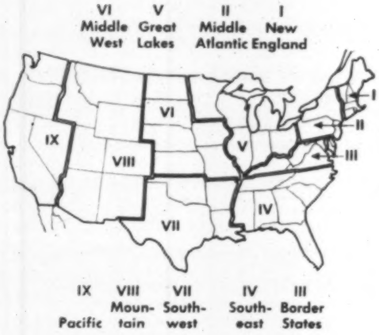
	1946	1949	1950	1955	1956	1957	1958	1959	1960
Jan	$1.30	$1.71	$1.75	$2.31	$2.41	$2.55	$2.71	$2.75	$2.88
Feb	1.30	1.71	1.77	2.33	2.44	2.56	2.71	2.76	2.91
Mar	1.28	1.70	1.77	2.31	2.45	2.55	2.71	2.74	2.99
Apr	1.31	1.71	1.75	2.34	2.42	2.58	2.68	2.75	2.87
May	1.31	1.71	1.76	2.34	2.44	2.61	2.69	2.76	2.90
June	1.31	1.70	1.76	2.34	2.48	2.62	2.67	2.79	2.91
July	1.36	1.71	1.78	2.36	2.49	2.65	2.71	2.81	....
Aug	1.35	1.71	1.79	2.38	2.51	2.67	2.73	2.82	....
Sept	1.37	1.73	1.83	2.39	2.53	2.70	2.78	2.85	....
Oct	1.40	1.74	1.83	2.40	2.55	2.69	2.78	2.90	....
Nov	1.43	1.75	1.84	2.40	2.54	2.70	2.73	2.85	....
Dec	1.43	1.78	1.88	2.41	2.55	2.70	2.78	2.88	....

MANUFACTURING

	1946	1949	1950	1955	1956	1957	1958	1959	1960
Jan	$1.00	$1.41	$1.42	$1.84	$1.93	$2.05	$2.10	$2.19	$2.29
Feb	1.00	1.40	1.42	1.85	1.93	2.05	2.10	2.20	2.29
Mar	1.04	1.40	1.42	1.85	1.95	2.05	2.11	2.22	2.29
Apr	1.06	1.40	1.43	1.86	1.96	2.05	2.11	2.23	2.28
May	1.07	1.40	1.44	1.87	1.96	2.06	2.11	2.23	2.29
June	1.08	1.41	1.45	1.87	1.97	2.07	2.12	2.24	2.29
July	1.09	1.41	1.46	1.89	1.96	2.07	2.13	2.23	....
Aug	1.11	1.40	1.46	1.88	1.98	2.07	2.13	2.19	....
Sept	1.13	1.41	1.48	1.90	2.01	2.08	2.14	2.22	....
Oct	1.14	1.39	1.50	1.91	2.02	2.09	2.14	2.21	....
Nov	1.15	1.39	1.51	1.93	2.03	2.11	2.17	2.23	....
Dec	1.16	1.41	1.54	1.93	2.05	2.10	2.19	2.27	....

• Series revised March, 1948 to cover both public and private contract construction and to include workers engaged in off-site operations for construction as well as site workers

Construction Labor Cost Trends



Though living costs measured by the BLS Cost of Living Index have been edging upward this year, the rise in construction wages and earnings has been much faster. Earnings in building construction in June were 5% greater than a year ago and in other-than-building up 4.3%, while the Cost of Living Index rose only 1.6%.

Cost of Living Index

1947-49=100

	1939	1949	1955	1956	1957	1958	1959	1960
Jan	59.6	102.7	114.3	114.6	118.2	122.3	123.8	125.4
Feb	59.4	101.6	114.3	114.6	118.7	122.5	123.7	125.6
Mar	59.3	101.9	114.3	114.7	118.9	123.3	123.7	125.7
Apr	59.2	102.1	114.2	114.9	119.3	123.5	123.9	126.2
May	59.1	101.8	114.2	115.4	119.6	123.6	124.0	126.3
Jun	59.0	102.0	114.4	116.2	120.2	123.7	124.5	126.5
Jul	59.2	101.4	114.7	117.0	120.8	123.9	124.9	126.6
Aug	59.0	101.6	114.5	116.8	121.0	123.7	124.8	.....
Sept	60.2	102.1	114.9	117.1	121.1	123.7	125.2	.....
Oct	60.0	101.5	114.9	117.7	121.1	123.7	125.5	.....
Nov	59.9	101.6	115.0	117.8	121.6	123.9	125.6	.....
Dec	59.6	101.0	114.7	118.0	121.6	123.8	125.5	.....

Pre-depr. high 77.0, Nov 1925—Depr. low 53.6, Apr 1933

Annual BLS wage indexes of July 1 wage rates are not yet available for 1960, nor are the BLS regional wage averages. However, ENR as well as BLS wage data point to another hefty increase to be added this year.

On July 1, '59, the BLS hourly wage index (excluding fringe benefits) for journeymen was more than 2.6 times the average 20 years previous and 58% more than 10 years earlier. A much faster rise is apparent in wages for journeymen's helpers and laborers. Their average rate in July '59 was 3.5 times the average of 20 years earlier and 75% greater than 10 years back.

Regionally, minimum union wage rates in July '59 averaged the highest in the Middle Atlantic states—$3.88 per hour, excluding fringe benefits. The average topped $3 per hour in all other regions except the Southeast. Journeymen's rates averaged $4.08 in the Middle Atlantic.

Union Wage Rates By Region—July 1, 1959

Trade	Region: US	New England I	Middle Atlantic II	Border States III	Southeast IV	Great Laeks V	Middle West VI	Southwest VII	Mountain VIII	Pacific IX
All building trades, July 1, 1957	$3.51	$3.30	$3.88	$3.30	$2.98	$3.58	$3.47	$3.03	$3.15	$3.51
Journeymen	$3.71	$3.55	$4.08	$3.58	$3.26	$3.73	$3.63	$3.34	$3.43	$3.68
Asbestos workers	3.77	3.77	4.15	3.81	3.41	3.74	3.65	3.56	3.60	3.79
Boilermakers	3.90	3.75	4.44	3.76	3.61	3.84	3.64	3.60	3.80	3.90
Bricklayers	4.04	3.75	4.43	3.85	3.72	3.97	4.00	3.78	3.86	3.98
Carpenters	3.63	3.40	4.12	3.43	3.08	3.67	3.55	3.19	3.28	3.51
Cement finishers	3.61	3.72	4.10	3.35	2.92	3.59	3.76	3.17	3.32	3.52
Electricians (inside wiremen)	3.81	3.66	3.97	3.77	3.42	3.83	3.80	3.51	3.64	4.01
Elevator constructors	3.83	3.69	4.18	3.73	3.46	3.84	3.71	3.57	3.67	3.82
Glaziers	3.39	3.25	3.72	3.27	2.74	3.49	3.43	2.94	2.93	3.40
Lathers	3.85	3.73	4.25	3.66	3.23	3.68	3.60	3.51	3.63	3.92
Machinists	3.81	3.90	3.98	3.73	3.35	3.84	3.75	3.49	3.49	3.86
Marble setters	3.75	3.76	3.93	3.74	3.59	3.75	3.68	3.43	3.37	3.74
Mosaic and terrazzo workers	3.79	3.75	4.12	3.60	3.38	3.64	3.83	3.26	3.53	3.65
Painters	3.40	3.12	3.42	3.29	2.98	3.50	3.43	3.02	3.16	3.50
Paperhangers	3.37	3.17	3.21	2.92	3.23	3.47	3.45	2.90	3.07	3.64
Pipefitters	3.87	3.67	4.18	3.60	3.44	3.85	3.86	3.61	3.72	3.97
Plasterers	3.88	3.70	4.32	3.64	3.17	3.79	3.74	3.47	3.67	3.82
Plumbers	3.89	3.67	4.20	3.67	3.50	3.84	3.85	3.49	3.71	4.01
Rodmen	3.71	4.03	4.20	3.60	3.24	3.80	3.54	3.20	3.42	3.47
Roofers, composition	3.44	3.54	3.85	2.89	2.60	3.64	3.40	2.64	3.21	3.39
Roofers, slate and tile	3.39	3.81	3.75	3.49	2.69	3.74	3.28	2.87	3.19	3.43
Sheet-metal workers	3.71	3.56	4.05	3.64	3.24	3.74	3.62	3.27	3.43	3.80
Stonemasons	3.91	3.77	3.95	4.03	3.80	3.80	3.85	3.91	3.90	4.01
Structural ironworkers	3.83	4.04	4.26	3.84	3.33	3.88	3.60	3.38	3.42	3.73
Tile layers	3.67	3.75	3.79	3.54	3.34	3.68	3.55	3.27	3.41	3.82
Helpers and laborers	2.74	2.62	3.13	2.31	1.84	2.90	2.62	1.87	2.35	2.91
Bricklayers' tenders	2.87	2.62	3.37	2.26	1.79	2.93	2.68	1.97	2.67	3.12
Building laborers	2.67	2.60	3.00	2.27	1.84	2.88	2.56	1.79	2.26	2.83
Composition roofers' helpers	2.36	2.62	2.71	2.35	1.80	2.53	2.70	1.68	....	2.48
Elevator constructors' helpers	2.75	2.58	3.12	2.69	2.42	2.70	2.59	2.48	2.57	2.68
Marble setters' helpers	2.97	2.86	3.27	2.75		2.99	2.67	2.05	2.65	2.93
Plasterers' laborers	3.00	2.75	3.19	2.50	1.85	3.06	2.84	2.04	2.75	3.63
Plumbers' laborers	2.61	....	2.92	2.42	1.78	2.88	2.83	1.74	2.62	2.81
Terrazzo workers' helpers	3.05	2.87	3.34	2.59	....	3.02	2.83	2.03	2.48	3.13
Tile layers' helpers	2.94	2.85	3.08	2.68	....	2.92	2.61	1.95	2.65	3.04

Union Wage Rates By City—July 1, 1960

Minimum base rate & fringe benefits in cities not covered by ENR (p. 60)

	Bricklayer	Carpenter	Electrician	Painter	Plasterer	Laborer
Albuquerque, N.M.	$4.250	$3.490+7½¢	$3.550+.0355	$3.050	$3.500	$2.200+7½¢
Burlington, Vt	3.750	2.750	3.000	1.750	3.750	2.200
Butte, Mont	3.750	3.350	3.550+.0355	3.370+9¢	3.500	2.550
Charlotte, N. C.	3.200	2.500	3.000+.0300	.....	2.750	1.450
Chattanooga, Tenn	4.000	3.300	3.650+.0365	3.050	3.500	2.100
Cheyenne, Wyo	4.000	3.140	3.680+.0368	3.000	3.500	2.200
Columbia, S. C.	3.000	2.250	3.250+.0325	2.500	3.000	.....
El Paso, Tex	3.950	3.350	3.700+.0370	2.925	3.500	1.875
Erie, Pa	4.100+10¢	3.615+10¢	3.875+.0387	3.250	3.700+10¢	2.675+20¢
Evansville, Ind	3.850	3.375	3.760+.0376	3.100+15¢	3.720	2.500+7½¢
Fargo, N. Dak	3.900	2.850	3.100	2.750	3.400	2.150
Grand Rapids, Mich	4.175	3.500+8¢	3.660+.2666	3.050+10¢	3.500	2.700
Hartford, Conn	3.950+23¢	3.550+23¢	4.175+.1253	3.370+10¢	3.950+23¢	2.800+7¢
Houston, Tex	4.000	3.440	3.925+.1892	3.225+7½¢	3.750+10¢	2.050
Knoxville, Tenn	3.925	3.225	3.500+.0350	2.900	3.525	2.000
Lansing, Mich	4.100	3.530+8¢	3.600+.3060	3.280+10¢	3.800+20¢	2.680+8¢
Las Vegas, Nev	4.525	4.025+20¢	4.450+.1445	3.900+12¢	4.350+13¢	3.225
Little Rock, Ark	3.700	3.200	3.475+.0347	3.063	3.400	1.750
Madison, Wis	3.800	3.350	3.960+.0796	3.240+9¢	3.600	2.800
Manchester, N. H.	3.850	3.270	3.250+.1325	2.580+12½¢	3.850	2.590
Memphis, Tenn	3.800+13¢	3.200	3.575+.1357	3.150	3.500	1.750
Miami, Fla	3.770	3.450	3.800+.1640	3.370+10¢	3.770	1.850
Mobile, Ala	3.800	3.300+12½¢	3.725+.1372	3.300	3.650+12½¢	1.900+12½¢
Montgomery, Ala	3.250	2.750	3.100+.0310	2.750	2.750	1.200
New Haven, Conn	3.850+23¢	3.550+23¢	3.925+.1392	3.450+23¢	3.850+23¢	2.800+17¢
Norfolk, Va	3.750	2.900	3.550+.0355	3,050	3.500	1,580
Oakland, Calif	4.150+35¢	3.725+36¢	4.205+.3102	3.670+34½¢	3.840+40¢	3.045+10¢
Peoria, Ill	4.325	3.900+3½¢	4.100+.0910	3.600	4.175+10¢	3.250
Portland, Maine	3.500	3.000	3.300+.0330	2.200	3.500	2.200
Providence, R. I.	3.925+12½¢	3.400+10¢	3.700+.1370	3.050+8½¢	3.925+10¢	2.650+7½¢
Reading, Pa	3.900+15¢	3.325	3.850+.1385	2.925+11¢	3.600	2.385+10¢
Richmond, Va	3.750	2.900	3.275+.0327	2.450	3.290	1.580
Rochester, N. Y.	4.160+15¢	3.825	4.120+.1412	3.550	4.160+15¢	2.860+20¢
Rock Island, Ill	3.900	3.370	3.800+.0380	3.200+10¢	3.750	2.730
Santa Fe, N. Mex	4.250	3.490+7½¢	3.550+.0355	3.050	3.500	2.200+7½¢
Savannah, Ga	3.500	3.150	3.550+.0355	2.750	2.750	1.650
Schenectady, N. Y.	3.800+10¢	3.500+7½¢	3.900+.2390	3.150	3.800+10¢	2.750+10¢
Scranton, Pa	3.750	3.175	3.625+.1612	2.875	3.650	2.450
Shreveport, La	3.900	3.050	3.725+.0372	2.900	3.625	1.725
Souix Falls, S. Dak	3.850	2.950	3.450+.0345	2.550	3.185	2.100
South Bend, Ind	3.900+9¢	3.400	3.750+.0375	3.200	3.360+7½¢	2.525+7½¢
Spokane, Wash	4.120+10¢	3.480+10¢	3.900+.0390	3.390+10¢	3.800+10¢	2.750+10¢
Springfield, Mass	3.750+.1125	3.430+11¢	3.750+.1875	3.175+10¢	3.750+.1125	2.550+7½¢
Syracuse, N. Y.	4.050+20¢	3.520+20¢	4.200+.1875	3.200+10¢	3.925+20¢	2.906+20¢
Tampa, Fla	3.600	3.250	3.650+.0365	2.900	3.600	1.675
Washington, D. C.	4.150+19¢	3.750+9¢	4.400+.1440	3.690+10¢	3.925+30¢	2.500+12½¢
Wichita, Kans	3.950	3.300	3.800+.0380	3.000	3.500	2.300
Wilmington, Del	4.025+10¢	3.800	4.125+.1412	3.300+10¢	3.900+15¢	2.250+7½¢
Worcester, Mass	3.900+15¢	3.650+10¢	3.550+.1355	3.300+15¢	3.900+15¢	2.750+10¢
York, Pa	3.500	3.050+5¢	3.625+.0862	2.650	3.500	2.050
Youngstown, Ohio	4.085+10¢	3.805+10¢	4.000+.1200	3.540+10¢	3.930+10¢	2.935+10¢

Base Rates on Compensation Insurance for Construction—July 1, 1960

Data Compiled by Herbert L. Jamison & Co., Insurance Advisors and Auditors, New York, N. Y.—(Base Rates in effect July 1, 1960—subject to increase or decrease according to experience ratings)

Classification of Work	Ala.	Alaska	Ariz.	Ark.	Cal.	Colo.	Conn.	Del.	D. C.	Fla.	Ga.	Hawaii	Idaho
Carpentry—1-2 Family Residence	$1.68	$2.51	$3.61	$3.89	$3.16	$1.94	$2.87	$1.90	$3.39	$3.28	$1.91	$4.47	$2.69
Carpentry—3 Stories or less	1.89	2.51	3.61	4.49	3.16	2.57	2.97	1.90	3.39	3.28	1.91	3.43	2.75
Carpentry—Interior trim—cab wk.	.78	2.15	3.61	2.05	3.16	1.20	1.97	1.90	2.44	2.72	1.06	3.93	1.45
Carpentry—General	2.21	3.96	3.61	4.74	6.14	2.97	4.23	1.90	4.81	5.08	3.08	5.15	3.82
Chimney Construction—Brick Con.	5.67	3.01	5.76	14.65	16.12	9.33	12.38	2.20	17.36	15.53	4.82	13.15	12.29
Concrete Work—Bridges, Culverts—C	3.18	7.93	6.05	5.82	6.90	5.73	5.49	2.20	10.42	5.45	3.64	7.92	6.14
Concrete Work—Dwellings—1-2 Families	.97	5.21	2.50	1.98	1.42	1.69	2.34	2.20	4.35	2.75	.89	2.94	2.52
Concrete Work—N. O. C.	1.92	3.01	2.50	5.08	4.27	3.32	4.55	2.20	5.39	5.36	2.08	3.82	2.66
Concrete or Cement Work—Floors, Sidewalks	.73	3.30	2.50	1.90	1.41	1.32	3.04	1.55	1.88	3.05	1.31	3.61	1.80
Electrical Wiring—Inside	1.06	1.41	1.87	1.71	2.00	1.40	1.44	.95	2.26	2.17	1.39	1.90	1.91
Excavation—Earth—N. O. C.	2.14	5.75	2.89	3.62	2.69	3.73	3.98	2.00	3.70	3.36	2.74	5.87	4.47
Excavation—Rock	3.46	7.46	4.89	6.73	8.67	6.01	7.66	2.00	9.05	9.43	4.32	8.69	5.39
Glaziers	2.15	3.34	2.89	5.26	3.93	3.39	4.84	1.35	5.73	4.51	2.92	5.21	4.35
Insulation Work	.94	3.77	2.52	2.18	4.56	1.80	2.31	1.90	2.39	2.43	1.06	2.82	2.47
Lathing	1.01	3.03	2.50	2.71	2.04	1.60	2.44	.80	2.65	2.25	1.46	2.89	1.97
Masonry	.98	3.92	2.33	2.00	2.93	1.69	2.76	.90	2.22	2.82	1.12	2.98	2.58
Painting and Decorating	1.41	3.17	2.39	2.79	3.94	1.79	2.99	1.30	5.18	3.19	1.53	2.83	3.03
Pile Driving	5.77	12.23	11.56	14.11	14.31	8.90	4.55	6.15	11.42	9.16	6.80	13.82	11.23
Plastering	.94	2.53	2.52	2.18	2.04	1.80	2.31	.80	2.39	2.67	1.06	2.82	2.47
Plumbing	.91	1.53	2.08	2.01	2.00	1.94	1.64	.75	2.51	2.19	1.62	2.33	1.42
Roofing	2.69	5.98	5.33	7.51	7.81	5.53	7.00	2.15	7.05	7.12	4.45	8.31	8.37
Sheet Metal Work—Erect, Instal & Repair	1.32	2.23	2.06	3.26	2.59	1.57	2.88	2.15	2.50	3.04	2.12	2.81	2.33
Steel Erection—Doors and Sash	1.41	4.24	1.47	3.36	2.50	2.28	3.81	5.60	4.17	3.23	1.75	3.11	2.73
Steel Erection—Interior Ornament	1.41	4.24	1.47	3.36	2.50	2.28	3.81	5.60	4.17	3.23	1.75	3.11	2.73
Steel Erection—Structural	5.52	37.21	12.67	15.43	13.95	9.92	10.35	5.60	27.80	17.59	9.35	25.53	15.58
Steel Erection—Dwelling—2 Stories	3.23	11.62	5.00	8.01	5.40	5.82	6.93	5.60	9.22	7.42	4.59	9.16	8.04
Steel Erection—N. O. C.	3.67	13.08	12.67	10.16	7.64	9.92	7.20	5.60	17.83	10.77	8.12	25.53	11.72
Tile Work—Interior	.67	.89	1.44	1.76	1.15	1.03	1.59	.55	2.35	1.61	.92	1.45	1.24
Timekeepers and Watchmen	1.52	5.14	1.78	3.25	2.66	2.31	4.02	B	3.73	3.98	2.11	2.84	3.10
Waterproofing—Interior (Brush)	1.41	3.17	2.39	2.79	3.94	1.79	2.99	1.30	5.18	3.19	1.53	2.83	3.03
Waterproofing—Trowel—Interior	.94	2.53	2.52	2.18	2.04	1.80	2.31	.80	2.39	2.67	1.06	2.82	2.47
Waterproofing—Trowel—Exterior	.98	3.92	2.33	2.00	2.93	1.69	2.76	.90	2.22	2.88	1.12	2.98	2.58
Waterproofing—Pressure Gun	1.92	3.01	2.50	5.08	4.27	3.32	4.55	2.20	5.39	5.36	2.08	3.82	2.66
Wrecking	7.88	13.82	12.22	21.16	26.23	13.80	16.07	8.95	17.99	17.85	9.31	31.56	17.70

Classification of Work	Ill.	Ind.	Iowa	Kan.	Ky.	La.	Me.	Md.	Mass.	Mich.	Minn.	Miss.
Carpentry—1-2 Family Residence	$2.23	$1.63	$1.77	$2.34	$1.94	$4.90	$1.39	$2.35	$3.57	$2.61	$2.42	$3.93
Carpentry—3 Stories or less	3.29	2.02	2.11	2.57	2.05	6.13	1.42	2.41	4.96	2.61	2.42	3.98
Carpentry—Interior trim—cab wk.	1.59	1.00	.94	1.43	.95	2.92	.76	2.11	1.92	1.64	2.42	2.43
Carpentry—General	4.04	3.06	2.63	4.70	2.08	6.99	2.35	3.95	10.21	2.61	4.89	6.51
Chimney Construction—Brick Con.	9.03	7.73	6.34	11.35	8.11	21.38	5.17	11.68	7.53	10.67	9.47	16.71
Concrete Work—Bridges, Culverts—C	4.11	2.43	4.03	5.03	2.24	7.61	3.61	5.34	4.60	3.91	5.05	8.65
Concrete Work—Dwellings—1-2 Families	1.07	1.12	1.05	1.59	1.24	2.29	1.36	2.20	3.21	1.95	1.79	2.26
Concrete Work—N. O. C.	3.34	2.17	2.29	4.51	1.83	6.02	1.82	4.13	6.48	2.97	2.47	3.82
Concrete or Cement Work—Floors, Sidewalks	1.69	.98	1.23	1.97	1.03	3.42	.96	2.72	3.57	1.38	1.84	2.00
Electrical Wiring—Inside	1.36	.88	.82	1.33	.87	2.08	.77	1.74	1.67	1.32	1.14	2.08
Excavation—Earth—N. O. C.	2.34	2.08	2.11	3.24	2.17	4.30	1.42	3.25	4.76	3.31	4.10	4.98
Excavation—Rock	8.05	4.32	3.38	7.20	4.95	11.45	3.49	7.29	9.07	5.00	3.65	12.06
Glaziers	2.64	2.49	2.49	4.06	2.78	6.18	2.06	4.40	4.62	3.91	3.80	6.05
Insulation Work	2.05	1.20	1.25	1.81	1.05	3.95	1.30	1.66	3.36	1.56	2.72	2.73
Lathing	1.07	1.30	1.22	1.80	1.24	3.79	1.02	2.09	3.57	1.22	1.44	3.12
Masonry	1.74	1.23	1.05	1.65	1.26	2.29	1.38	2.25	3.30	1.74	1.42	2.29
Painting and Decorating	2.14	1.99	1.36	1.92	1.61	3.78	1.34	3.06	3.39	2.28	1.94	3.39
Pile Driving	6.58	5.35	4.69	10.74	6.27	14.47	2.58	6.92	7.05	6.17	6.07	19.34
Plastering	1.36	1.20	1.25	1.81	1.05	2.73	1.30	1.66	2.65	1.56	1.39	2.73
Plumbing	1.55	1.37	1.28	1.62	1.09	3.30	.85	1.86	2.21	1.46	1.99	2.30
Roofing	6.40	4.97	5.21	5.78	4.13	7.38	4.35	6.92	13.92	6.24	6.17	10.25
Sheet Metal Work—Erect, Instal & Repair	1.77	1.63	1.45	2.05	1.65	3.37	1.09	2.46	12.94	2.27	1.80	6.04
Steel Erection—Doors and Sash	1.92	1.88	1.68	2.59	1.79	5.15	1.43	3.01	3.80	2.45	2.34	4.19
Steel Erection—Interior Ornament	1.92	1.88	1.68	2.59	1.79	5.15	1.43	3.01	3.80	2.45	2.34	4.19
Steel Erection—Structural	10.40	5.51	10.31	14.36	7.40	12.94	5.64	13.03	19.68	12.73	9.49	12.56
Steel Erection—Dwelling—2 Stories	5.99	3.31	4.18	6.80	3.71	9.67	3.02	6.41	11.86	4.20	6.41	8.97
Steel Erection—N. O. C.	9.67	5.51	6.76	7.29	5.18	12.94	3.83	9.86	14.50	5.52	6.33	11.23
Tile Work—Interior	.98	.88	.80	1.24	.80	2.03	.70	1.35	2.44	1.24	1.22	2.05
Timekeepers and Watchmen	3.03	2.07	1.76	2.95	1.88	5.62	1.53	3.23	6.30	2.73	2.89	3.83
Waterproofing—Interior (Brush)	2.14	1.99	1.36	1.92	1.61	3.78	1.34	3.06	3.39	2.28	1.94	3.39
Waterproofing—Trowel—Interior	1.36	1.20	1.25	1.81	1.05	2.73	1.30	1.66	2.65	1.56	1.39	2.73
Waterproofing—Trowel—Exterior	1.74	1.23	1.05	1.65	1.26	2.29	1.38	2.25	3.30	1.74	1.42	2.29
Waterproofing—Pressure Gun	3.34	2.17	2.29	4.51	1.83	6.02	1.82	4.13	6.48	2.97	2.47	3.82
Wrecking	14.47	6.63	9.30	11.97	9.80	22.41	8.48	18.82	22.70	10.66	13.72	18.92

Classification of work	Mo.	Mont.	Neb.	D Nev.	N.H.	N.J.	N.M.	N.Y.	N.C.	D N.D.	D Ohio	Okla.	D Ore.
Carpentry—1-2 Family Residence	$2.64	$3.51	$1.95	$4.81	$1.65	$3.40	$3.60	$3.00	$2.71	$2.34	$1.72	$4.68	$3.03
Carpentry—3 stories or less	2.78	3.66	2.43	5.01	1.69	3.50	4.30	4.40	3.07	2.34	2.13	5.59	3.10
Carpentry—Interior trim—cab wk	2.61	1.70	1.08	2.33	.92	1.75	1.77	4.40	1.62	2.34	1.05	4.51	1.85
Carpentry—General	3.83	6.35	2.85	8.70	2.60	4.60	6.45	4.40	3.97	4.73	3.23	7.16	4.70
Chimney Construction—Brick Con	17.72	15.32	8.15	20.99	6.53	11.70	12.35	29.60	11.55	9.16	8.15	19.57	7.60
Concrete Work—Bridges, Culverts—C	5.49	6.38	3.36	9.19	3.56	5.70	8.83	6.10	5.74	4.88	2.56	14.15	5.74
Concrete Work—Dwellings—1-2 Families	2.22	2.66	1.42	3.64	1.47	2.65	1.59	5.10	1.20	1.73	1.18	2.77	3.57
Concrete Work—N.O.C	5.25	5.50	3.40	7.54	2.00	5.70	3.05	5.10	2.57	2.39	2.29	10.29	4.10
Concrete or Cement Work—Floors, Sidewalks	2.17	2.10	1.50	2.88	1.13	2.55	2.26	2.70	1.35	1.78	1.03	3.10	1.53
Electrical Wiring—Inside	1.77	1.65	1.27	2.26	1.07	2.15	1.78	2.50	1.38	1.10	.93	2.61	1.73
Excavation—Earth—N.O.C	4.44	5.53	2.08	7.58	2.65	4.00	3.25	5.20	3.12	3.96	2.19	6.10	3.49
Excavation—Rock	8.17	8.32	6.00	11.40	4.92	8.20	7.05	8.50	9.97	3.53	4.55	6.74	7.27
Glaziers	4.04	5.19	3.05	7.11	2.53	4.60	4.79	4.50	4.10	3.67	2.62	5.58	3.91
Insulation Work	2.54	2.91	1.25	3.99	1.50	4.80	3.14	4.40	1.50	2.63	1.26	5.29	2.66
Lathing	2.20	2.30	1.41	3.15	1.20	2.35	2.24	2.60	1.95	1.39	1.37	2.84	2.59
Masonry	2.50	2.78	1.46	3.81	1.50	3.50	2.38	4.20	1.21	1.37	1.30	2.64	3.66
Painting and Decorating	2.89	3.96	1.91	5.43	2.32	5.20	2.69	4.80	2.42	1.88	2.10	3.31	3.59
Pile Driving	7.92	13.57	6.88	18.59	3.32	8.00	12.70	8.40	8.52	5.87	5.64	17.69	7.71
Plastering	1.54	2.91	1.25	3.99	1.50	2.35	3.14	3.70	1.50	1.34	1.26	3.55	2.66
Plumbing	2.99	1.74	1.15	2.38	1.17	2.45	2.42	3.00	1.56	1.92	1.44	2.81	1.71
Roofing	7.27	10.03	5.24	13.74	5.76	10.30	8.69	8.90	6.09	5.97	5.24	18.02	7.93
Sheet Metal Work—Erect., Install & Repairs	2.78	2.78	1.86	3.81	1.44	2.65	2.50	4.30	2.62	1.74	1.72	3.80	2.96
Steel Erection—Doors and Sash	2.82	3.23	2.01	4.43	1.67	5.10	3.14	3.20	2.75	2.26	1.98	5.29	2.33
Steel Erection—Interior Ornament	2.82	3.23	2.01	4.43	1.67	5.10	3.14	3.20	2.75	2.26	1.98	5.29	2.33
Steel Erection—Structural	11.92	20.20	8.32	27.67	7.70	13.90	9.57	13.80	12.47	9.18	5.81	18.58	15.53
Steel Erection—Dwelling—2 stories	8.16	8.61	4.99	11.80	3.71	6.60	8.61	4.40	5.82	6.20	3.49	13.13	7.29
Steel Erection—N.O.C	9.20	13.85	7.36	18.97	6.59	7.70	9.57	10.80	7.22	6.12	5.81	18.58	11.06
Tile Work—Interior	1.49	1.43	.95	1.96	.83	1.75	1.56	2.10	1.09	1.18	.93	2.11	1.28
Timekeepers and Watchmen	4.49	3.64	2.19	4.99	1.81	2.65	3.65	3.60	2.87	2.79	2.18	4.11	3.58
Waterproofing—Interior—(Brush)	2.89	3.96	1.91	5.43	2.32	5.20	2.69	4.80	2.42	1.88	2.10	3.31	3.59
Waterproofing—Trowel—Interior	1.54	2.91	1.25	3.99	1.50	2.35	3.14	3.70	1.50	1.34	1.26	3.55	2.66
Waterproofing—Trowel—Exterior	2.50	2.78	1.46	3.81	1.50	3.50	2.38	4.20	1.21	1.37	1.30	2.64	3.66
Waterproofing—Pressure Gun	5.25	5.50	3.40	7.54	2.00	5.70	3.05	5.10	2.57	2.39	2.29	10.29	4.10
Wrecking	17.72	21.71	12.53	29.74	10.30	18.70	20.37	A	13.29	13.27	6.99	18.97	20.90

Classification of work	Pa.	R.I.	S.C.	S.D.	Tenn.	Tex.	Utah	Vt.	Va.	D Wash.	D W. Va.	Wis.	D Wyo.
Carpentry—1-2 Family Residence	$.95	$2.82	$3.20	$1.04	$2.96	$4.05	$1.53	$2.47	$1.70	$1.96	$1.94	$2.22	$1.35
Carpentry—3 stories or less	.95	3.22	3.24	1.07	3.00	4.05	1.53	2.50	1.95	2.02	2.05	2.45	1.35
Carpentry—Interior trim—cab wk	.95	2.32	1.74	.78	1.55	3.27	1.53	1.09	1.05	.65	.95	2.22	1.35
Carpentry—General	.95	6.05	5.48	2.62	3.44	5.13	1.53	3.10	2.48	2.59	2.08	3.56	1.35
Chimney Construction—Brick Con	1.70	19.35	15.24	4.25	11.28	14.93	7.46	7.66	6.66	9.74	8.11	10.45	6.56
Concrete Work—Bridges, Culverts—C	1.70	7.20	9.41	2.71	3.86	9.78	3.60	4.59	2.18	2.94	2.24	4.38	3.17
Concrete Work—Dwellings—1-2 Families	1.70	3.02	1.42	.94	1.62	3.27	1.80	2.18	.86	1.86	1.24	1.46	1.58
Concrete Work—N.O.C	1.70	8.44	2.98	2.25	2.96	5.93	3.02	2.92	2.65	2.13	1.83	2.51	2.66
Concrete or Cement Work—Floors, Sidewalks	1.05	2.61	2.19	.94	1.39	2.71	.92	1.37	1.20	1.01	1.03	1.76	.81
Electrical Wiring—Inside	.95	1.08	2.22	.76	1.41	2.12	1.34	1.14	1.01	.99	.87	1.23	1.18
Excavation—Earth—N.O.C	2.05	3.78	4.04	1.51	3.49	4.37	1.96	2.95	2.26	2.24	2.17	3.34	1.72
Excavation—Rock	2.05	9.56	8.61	2.75	5.49	10.25	2.74	5.23	4.41	4.84	4.95	7.13	2.41
Glaziers	1.40	6.88	5.65	1.89	3.85	3.41	.96	3.01	2.18	2.21	2.78	3.48	.84
Insulation Work	1.55	2.97	2.16	1.21	1.98	4.48	1.94	1.78	1.02	1.74	1.05	2.48	1.71
Lathing	.85	3.10	2.63	.94	2.10	2.13	1.37	1.41	1.47	1.68	1.24	1.29	1.21
Masonry	1.25	3.11	1.43	1.97	1.65	3.27	1.32	2.21	.99	1.91	1.26	1.59	1.16
Painting and Decorating	2.35	2.35	4.21	1.56	1.94	2.98	1.12	2.08	1.97	2.13	1.61	1.92	.99
Pile Driving	2.45	7.87	10.39	5.10	10.55	14.68	4.58	3.97	5.92	4.98	6.27	8.71	4.03
Plastering	.85	2.97	2.16	1.21	1.98	3.41	1.94	1.78	1.02	1.74	1.05	1.57	1.71
Plumbing	.90	1.76	2.18	.79	1.73	2.88	1.19	1.48	1.17	.87	1.09	1.56	1.05
Roofing	2.85	9.06	5.61	3.63	5.50	8.44	4.42	5.79	3.86	11.97	4.13	9.59	3.89
Sheet Metal Work—Erect., Install & Repairs	2.85	2.77	3.77	1.13	2.59	4.32	1.51	1.75	1.88	1.90	1.65	1.81	1.33
Steel Erection—Doors and Sash	4.95	4.37	3.36	1.33	2.76	3.81	1.38	2.00	2.01	2.73	1.79	3.14	1.21
Steel Erection—Interior Ornament	4.95	4.37	3.36	1.33	2.76	3.81	1.38	2.00	2.01	2.73	1.79	3.14	1.21
Steel Erection—Structural	4.95	17.37	15.41	5.80	7.36	14.77	5.69	10.96	6.32	8.06	7.40	7.32	5.00
Steel Erection—Dwelling—2 stories	4.95	10.08	10.06	2.77	4.64	14.77	4.22	5.23	3.46	3.83	3.71	4.73	3.71
Steel Erection—N.O.C	4.95	14.70	12.45	2.93	5.96	6.07	5.69	7.82	4.01	5.37	5.18	9.88	5.00
Tile Work—Interior	.75	1.97	1.62	.68	1.01	1.81	1.43	1.00	.83	.70	.80	.93	1.26
Timekeepers and Watchmen	B	4.82	3.26	1.54	3.14	1.85	2.03	2.17	1.91	2.17	1.88	3.03	1.79
Waterproofing—Interior—(Brush)	4.95	2.35	4.21	1.56	1.94	2.98	1.12	2.08	1.97	2.13	1.61	1.92	.99
Waterproofing—Trowel—Interior	.85	2.97	2.16	1.21	1.98	3.41	1.94	1.78	1.02	1.74	1.05	1.57	1.71
Waterproofing—Trowel—Exterior	1.25	3.11	1.43	.97	1.65	3.27	1.32	2.21	.99	1.91	1.26	1.59	1.16
Waterproofing—Pressure Gun	1.70	8.44	2.98	2.25	2.96	5.93	3.02	2.92	2.65	2.13	1.83	2.51	2.66
Wrecking	13.30	24.16	22.19	7.93	13.73	23.64	16.42	12.24	6.75	10.94	9.80	10.68	14.45

*A Specially rated—refer to company. *B Assigned to main classification. *C Includes form work. *D Subscription to State Fund mandatory: Industrial Commission, Carson City, Nev.; Workmen's Compensation Bureau, Bismarck, N. Dak; The Industrial Commission of Ohio, Columbus, Ohio; Industrial Accident Commission, Salem, Ore.; Department of Labor and Industry, Olympia, Wash.; State Compensation Commission, Charleston, W. Va.; Workmen's Compensation Dept., State Treasurer's Office, Cheyenne, Wyo. *N.O.C. Not otherwise classified.

Safety

Work Injuries Edge Upward

The frequency of work injuries in contract construction increased slightly in 1959, according to preliminary figures of the Bureau of Labor Statistics. BLS preliminary figures for '59 indicate that work injuries in contract construction increased 11% (as a result of an increase in both employment and injury rates).

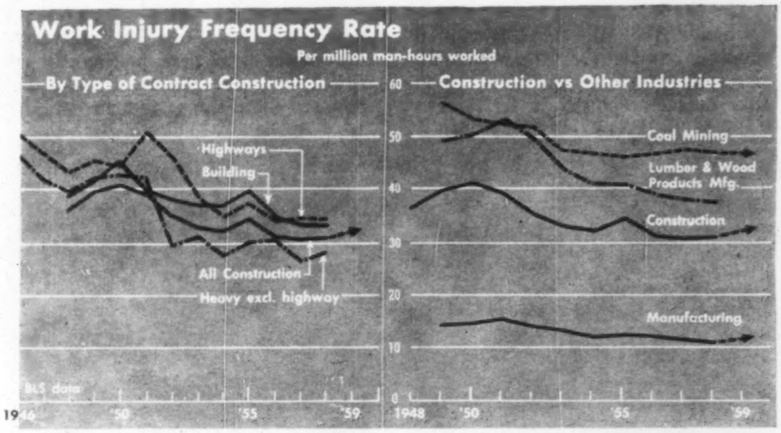
If the final figures bear out the earlier indications, 1959 would be the second consecutive year to show a slightly increased frequency rate for the industry. However, such an increase as this points to would probably not lift the injury rate back up to the high of 1950. And it will probably remain below the more recent high of 1955 (see chart at right).

While contractors are becoming more conscious of the need for effective safety programs on the job and while their efforts seem to be bearing fruit, according to the general downtrend in injury rates during the 1950s, compensation insurance rates have tended to rise sharply in many states. This is apparent in the limited sample of rates in the table at the right. Except in New York where the 1960 rates are unchanged from '59, compensation insurance rates are up for all but a few of the selected trades in the other states shown. Compared to 1950, 1960 rates are down sharply in New York, but they are generally much higher than 1950 in the other selected states.

Actual compensation rates and the trend vary by state according to the experience records, new legal requirements and changes in benefits. Some states, Alaska and Washington, for example, have much lower compensation insurance rates for most trades in 1960 than in 1950. Sharp drops in many Washington State rates between July '59 and July '60 account for most of the net decline in the past ten years. Alaska, on the other hand, had increases in over half of its rates in the past year.

All rates listed in the tabulation (opposite page) for Arkansas are up over July '59. But in Arizona, many rates are lower and several are the same as last year. Nevada rates are up almost across the board, but in Nebraska, three out of four rates are down. Obviously, it's unrealistic to generalize about the trend in compensation insurance rates.

Important in cost estimating, compensation insurance rates are multiplied by each $100 of wages paid. The rates for key trades and the common types of work that they do are in the table at the left, compiled by Herbert L. Jamison & Co., Insurance Advisors and Auditors, New York.



How Compensation Rates Have Changed, 1951-'60

Rates compiled by Herbert L. Jamison & Co., Insurance Advisors and Auditors, New York, N. Y.

	Jan 1 1951	Jul 1 1959	Jul 1 1960	Change† '51-'60 %	Change† '59-'60 %		Jan 1 1951	Jul 1 1959	Jul 1 1960	Change† '51-'60 %	Change† '59-'60 %
California						**New York**					
Excavation, earth	1.86	2.10	2.69	+45	+28	**Excavation, earth**	6.95	5.20	5.20	−25	0
Concrete work*	2.46	3.37	4.27	+74	+27	**Concrete work***	6.39	5.10	5.10	−20	0
Carpentry, 1-3 story	3.53	2.61	3.16	−10	+21	**Carpentry, 1-3 story**	5.97	4.40	4.40	−26	0
Steel erection♯	12.83	11.18	13.95	+9	+25	**Steel erection♯**	23.17	13.80	13.80	−40	0
Roofing	6.23	6.34	7.81	+25	+23	**Roofing**	**	8.90	8.90	**	0
Flordia						**Ohio**					
Excavation, earth	1.92	3.97	3.36	+75	−15	**Excavation, earth**	1.30	1.93	2.19	+68	+13
Concrete work*	2.44	4.70	5.36	+120	+14	**Concrete work***	1.65	2.28	2.29	+39	+0.4
Carpentry, 1-3 story	2.15	3.03	3.28	+53	+8	**Carpentry, 1-3 story**	2.32	2.04	2.13	−8	+4
Steel erection♯	9.46	15.48	17.59	+86	+14	**Steel erection♯**	5.74	5.96	5.81	+1	−3
Roofing	3.34	6.99	7.12	+113	+2	**Roofing**	4.18	4.52	5.24	+25	+16
Massachusetts						**Texas**					
Excavation, earth	4.13	3.94	4.76	+15	+21	**Excavation, earth**	2.33	4.67	4.37	+88	−6
Concrete work*	6.01	5.81	6.48	+8	+12	**Concrete work***	3.32	5.40	5.93	+79	+10
Carpentry, 1-3 story	3.58	4.55	4.96	+39	+9	**Carpentry, 1-3 story**	3.32	3.71	4.05	+22	+9
Steel erection♯	20.02	18.18	19.68	−2	+8	**Steel erection♯**	8.91	16.71	14.77	+66	−12
Roofing	13.35	13.54	13.92	+4	+3	**Roofing**	5.37	8.52	8.44	+57	−1

*† Not adjusted for any legal requirements or changes in benefits which may have affected rates ** General; incl form work *♯ Structural *** Rate varies with type of work

Work Injury Rate Up and Severity Increased in '58

US Bureau of Labor Statistics

	Number of establishments reporting 1958	1957	1956	Injury frequency *a* 1958	1957	1956	Severity rate *b* 1958	1957	1956	Average days lost *c* 1958	1957	1956	1958 Injuries Per cent resulting in Death	Perm impair *d*	Temp total	1957 Injuries Per cent resulting in Death	Perm impair *d*	Temp total
Contract construction	8,145	5,096	5,734	30.9	30.7*R*	31.2	2.55	2.52	2.33	90	95	85	0.9	2.9	96.2	0.9	3.0	96.1
General building contractors	2,453	1,577	1,836	33.5	33.5*R*	34.5	2.64	1.95	1.83	79	56	53	0.7	3.0	96.3	0.4	2.7	96.9
Heavy construction	382	302	367	28.5	26.6	30.9	4.02	4.41	3.84	141	166	121	1.7	2.9	95.4	1.9	3.5	94.6
Highway & street	643	539	603	34.4	34.8	34.2	3.23	4.15	3.86	94	119	113	0.8	2.9	96.3	1.1	3.9	95.0
Special-trade contractors	4,667	2,678	2,928	29.1	28.9	28.1	2.06	2.14	2.04	74	82	85	0.6	2.9	96.5	0.7	2.4	96.9
Plumb, heat, air cond	1,130	680	768	26.4	25.9	26.2	1.45	1.07	1.02	55	42	39	0.5	2.4	97.1	0.3	1.5	98.2
Painting & decorating	523	250	309	21.9	22.6	18.6	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Electrical	615	402	415	23.3	25.7	21.6	1.60	0.93	1.39	69	36	65	0.3	3.1	96.6	0.2	1.9	97.9
Masonry, stonework, tile setting & plastering	816	424	515	32.2	31.6	29.2	0.96	4.71	0.98	30	149	34	0.1	1.7	98.2	1.4	3.8	94.8
Roofing & sheet-metal	428	256	278	44.8	39.8	53.3	2.98	1.49	3.61	67	37	68	0.5	2.1	97.4	0	2.0	98.0
Structural steel erection	105	67	56	27.5	31.0	32.4	4.04	6.31	10.86	147	203	335	1.4	4.8	93.8	2.5	3.5	94.0
Misc. spec-trade contractors	1,050	599	587	32.1	31.4	30.2	3.00	1.42	2.44	92	59	80	0.9	3.2	95.9	0.6	2.0	97.4

**a* average number of disabling work injuries per million employee-hours worked **b* average number of days lost for each 1,000 employee-hours worked; **c* charged to each case **d* includes permanent-total and permanent-partial impairments **R* revised

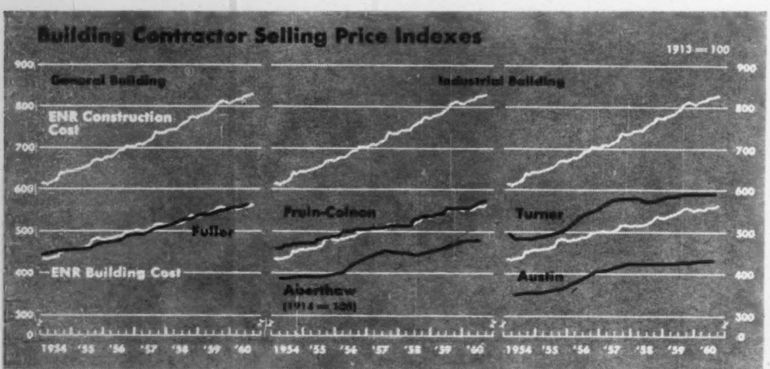
3rd Quarterly Cost Roundup

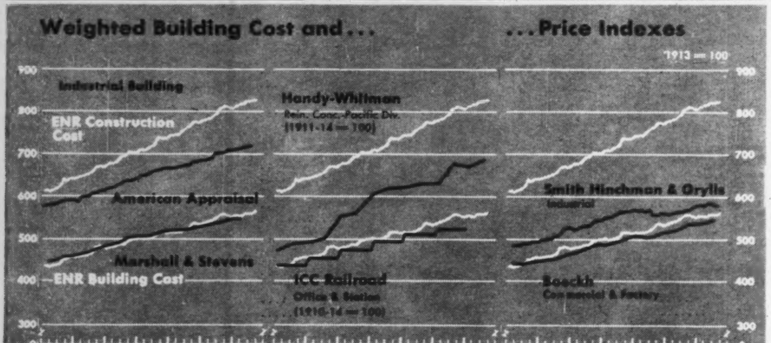
Building Cost & Price Indexes

Costs by

The building cost rise is slowing down this year. All of the "weighted" building cost indexes show this and most of the five contractor selling price indexes reported to ENR agree.

Two of the contractor indexes haven't moved this year; two have increased at a slower pace than in the year-ago period; only the Aberthaw index has increased more this year than last.


Building Contractor Selling Price Indexes


Weighted Building Cost and ... ...Price Indexes

Building Cost Trends by Type—1913=100

	Weighted Cost Indexes					Contractor Price Indexes							Com-posite Cost
	General Construction		Industrial		Comm'l & Factory	General Building		Industrial				Gen.	
Yr. & Month	ENR Constr. Cost	Assoc. Gen. Contr.	American Appraisal Co.	Marshall & Stevens	E. H. Boeckh *cd*	ENR Bldg. Cost	Smith Hinchman & Grylls *ag*	Aber-thaw *be*	Austin *g*	Fruin. Colnon	Turner	Fuller *h*	U. S. Dept. Comm. *d*
1913	100	100	100	100	100	100	...	...	100	100	100	100	...
1926	208	197	217	185	181	185	185	197	185	218	195	202	179
1932	157	171	155	130	144	141	128	168	117	178	136	157	140
1939	236	188	200	183	191	197	199	190	152	208	182	195	180
1945	308	231	271	248	252	239	285	236	234	247	258	241	235
1946	346	257	322	288	275	262	319	279	273	285	318	290	269
1949	477	342	490	365	369	352	395	312	307	382	413	382	363
1955	660	439	608	479	465	469	522	398	366	483	498	462	440
1956	692	462	635	503	489	491	544	427	400	503	544	482	465
1957	724	483	663	515	507	509	568	453	420	512	576	504	482
1958	759	499	682	528	517	525	565	453	427	530	576	526	486
1959	**797**	**517**	**704**	**544**	**535**	**548**	**575**	**473**	**429**	**551**	**587**	**545**	**496**
Oct	811	526	712	...	540	555	583	...	...	556	589	549	500
Nov	810	526	713	...	540	554	585	...	...	556	...	...	504
Dec	809	526	714	552	542	553	586	479	431	556	...	...	507
1960													
Jan	812	527	714	...	542	554	590	...	...	556	589	556	500
Feb	813	527	715	...	545	555	590	...	...	556	...	...	504
Mar	813	529	716	552	544	555	590	...	431	568	...	...	504
Apr	813	529	717	...	544	555	590	...	...	568	589	557	504
May	819	530	719	...	546	560	588	...	...	568	...	...	507*p*
Jun	827	535	720	554	546	561	583	481	431	568	...	...	...
Jul	829	537	722	...	...	561	581	...	...	572	589	...	...
Aug	830	538	...	...	...	561	581	...	...	572	...	...	...
Sep	831	...	...	...	...	563	...	...	...	...	...	...	...

*a Incl adjustment for estimated changes in productivity *b 1914=100 *c Incl contractor overhead, profit and adjustment for estimated changes in productivity *d 1915=100 *e Semi-annual since Sep. '56 *f Computed on 1926–29 base *g Computed in 1926 base *h Computed on 1939 base *p Preliminary

But only one index has actually declined this year. The Smith Hinchman & Gyrlls index, after topping out in January and holding steady through April, dipped each month from June through July before leveling off. The E. H. Boeckh & Associates commercial and factory building cost index slipped in March, but has since edged up to a new all-time high.

Lower or steady materials prices this year helped steady the indexes. But since spring, wage increases have exerted enough upward pressure to keep most of these indexes on the rise. This is reflected in last June's statement by Aberthaw Construction Co. President Ambrose Burton: "We are currently able to make substantial savings on purchases of structural steel and reinforcing rods. Our lumber costs are lower. The lower material costs do not quite offset recent wage rate increases in the building trades. The net result is an increase of 0.5% in the quarterly Aberthaw industrial building cost index value for June.

ENR Cost Indexes show that the 1960 price trend for the combination of basic materials and labor that contractors need is up in nearly all major cities. Of the 20 cities covered by the ENR indexes, only Chicago and New Orleans indexes in September are below December '59 (due to lower lumber prices).

Steam electric power plant construction costs increased between January and July, Handy-Whitman cost indexes show (table at right). But costs in several regions didn't recoup the January '60 drop, which was mainly due to lower equipment costs. Reinforced concrete building costs rose to new highs in all regions, including the North Central and the Pacific, where the indexes had dipped between July '59 and January '60.

The semi-annual Handy-Whitman cost indexes, individual series for 103 cost elements in three classes of utility construction, are weighted by experience in cost analysis of plants and building. Materials prices are from

Monthly Index History

Historical record of ENR Cost Indexes, graphs and tables for all years 1913-60 is in the supplement to ENGINEERING NEWS-RECORD, *Mar. 24, 1960. Reprints are available at $0.50 each from Business News Department, Engineering News-Record, 330 W. 42nd St., New York 36, N. Y.*

Type and by Region

ENR, IRON AGE and manufcturers; labor rates from BLS, unions and builder associations.

For a full description of these cost and prices indexes, see the Cost Report in ENR Mar. 24, 1960.

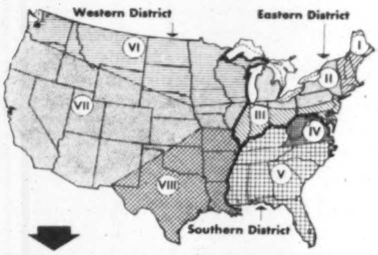
ENR Cost Indexes for 22 Cities—1913 = 100

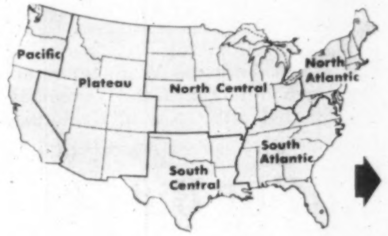
Construction Cost Index

City	September '49	September '57	September '58	1959 Mar	1959 Jun	1959 Sep	1959 Dec	1960 Mar	1960 Jun	1960 Sep
Atlanta	345	550	584	594	594	624	623	639	633	650
Baltimore	424	670	708	711	711	745	745	740	755	755
Birmingham	389	563	599	622	624	652	652	653	654	674
Boston	525	773	809	810	832	836	823	833	836	833
Chicago	541	838	857	866	875	923	918	919	919	917
Cincinnati	496	751	780	785	790	818	814	815	845	844
Cleveland	525	861	874	893	919	925	921	920	944	943
Dallas	394	547	573	573	573	604	604	604	629	639
Denver	470	710	731	731	742	742	747	758	753	756
Detroit	514	832	889	897	945	945	942	946	966	964
Kansas City	511	742	768	773	793	803	798	798	823	818
Los Angeles	489	778	822	828	839	877	868	870	870	908
Minneapolis	512	788	825	839	855	860	859	860	890	890
New Orleans	379	581	602	617	620	635	641	644	649	640
New York	533	890	953	968	978	1016	1008	1011	1008	1038
Philadelphia	517	776	803	791	804	795	791	793	830	830
Pittsburgh	492	791	827	827	840	858	849	870	885	885
St. Louis	524	796	849	854	891	880	874	880	900	895
San Francisco	483	763	820	817	824	858	850	851	885	883
Seattle	530	756	799	830	836	839	831	859	857	855
Montreal	396	587	603	603	610	620	630	630	650	650
Toronto	...	608	622	642	671	666	657	673	697	692
U. S. Average	**480**	**738**	**773**	**781**	**794**	**812**	**807**	**813**	**827**	**831**

Building Cost Index

City	September '49	September '57	September '58	1959 Mar	1959 Jun	1959 Sep	1959 Dec	1960 Mar	1960 Jun	1960 Sep
Atlanta	309	458	472	477	477	497	499	503	498	501
Baltimore	354	518	534	543	544	553	558	553	562	561
Birmingham	330	468	488	495	498	513	515	517	518	526
Boston	361	531	547	551	560	566	554	565	566	567
Chicago	352	530	560	569	578	586	581	582	594	592
Cincinnati	362	507	519	525	529	540	539	540	551	549
Cleveland	342	527	527	539	554	558	554	553	562	561
Dallas	316	451	469	472	474	490	490	491	519	524
Denver	359	522	530	532	537	540	545	542	545	551
Detroit	351	545	573	579	599	599	595	599	608	605
Kansas City	357	516	533	538	548	558	553	553	562	559
Los Angeles	336	508	527	536	552	560	554	556	566	569
Minneapolis	361	537	554	554	564	569	569	570	573	581
New Orleans	325	477	485	494	499	508	511	514	517	507
New York	397	590	622	629	639	652	643	646	647	648
Philadelphia	394	562	581	570	583	582	578	580	583	585
Pittsburgh	375	566	593	595	595	610	601	609	618	621
St. Louis	379	546	567	576	590	579	573	579	583	579
San Francisco	341	497	533	538	550	551	549	553	553	560
Seattle	340	467	484	493	499	508	500	504	504	506
Montreal	316	437	452	449	450	457	459	459	466	466
Toronto		468	469	482	500	497	488	498	497	492
U. S. Average	**352**	**516**	**535**	**540**	**548**	**556**	**553**	**555**	**561**	**563**





Railroad Cost Indexes

Interstate Commerce Commission, 1910-14 = 100

Station and Office Buildings

Region	1926	1932	1939	1945	1949	1955	1956	1957	1958	1959
US	**184**	**141**	**166**	**244**	**368**	**460**	**480**	**500**	**515**	**531**
I	183	142	167	238	361	449	468	488	502	518
II	185	142	168	244	371	460	479	499	514	531
III	185	142	168	241	369	466	486	506	521	538
IV	183	136	160	248	367	457	477	497	512	529
V	180	136	160	248	369	458	478	498	513	529
VI	186	140	169	247	370	466	486	506	520	537
VII	182	142	165	244	367	454	474	495	509	525
VIII	189	142	166	248	369	459	480	500	514	530

Road Construction

Region	1926	1932	1939	1945	1949	1955	1956	1957	1958	1959
US	**167**	**131**	**137**	**197**	**270**	**330**	**352**	**370**	**377**	**385**
I	173	134	140	206	287	342	363	381	388	394
II	168	133	141	202	283	344	367	386	394	401
III	168	132	142	205	286	346	368	388	395	402
IV	163	126	131	195	259	319	340	358	365	372
V	165	129	136	195	265	326	348	366	373	382
VI	164	129	132	190	253	317	337	355	360	368
VII	166	131	133	188	256	318	340	358	364	372
VIII	168	133	140	198	270	329	351	369	376	385

Ratio of RR Costs

	Computed 1930 %	Computed 1949 %	Computed 1953 %
Road construction	68.75	68.40	66.66
Equipment, work	0.66	0.56	0.54
Equipment, rolling & floating	23.03	24.47	26.38
General	7.56	6.57	6.42
Total	100.00	100.00	100.00

Road Construction By Accounts

	1926	1932	1939	1949	1957	1958	1959
Engineering	166	131	137	270	370	377	385
Other rt of way exp	159	121	135	258	315	324	332
Grading	153	106	90	139	159	159	160
Tunnels & subways	178	119	140	339	404	405	408
Brdg. culv & trestl	170	122	149	374	482	491	489
Elevated structures	165	129	149	382	529	539	530
Ties	173	144	158	302	381	381	396
Rails	144	140	136	245	406	414	426
Other track material	177	163	167	278	426	449	459
Ballast	175	146	143	254	348	348	355
Track laying & surf	188	164	165	366	541	543	569
Fences, snow sheds	178	147	141	279	393	395	398
Station & office bldgs	184	141	166	368	500	515	531
Roadway buildings	187	140	162	386	504	520	538
Water stations	182	147	166	327	448	468	480
Fuel stations	180	144	159	357	483	503	520
Shops & eng houses	185	137	165	379	510	526	543
Grain elevators	190	137	164	367	503	520	538
Storage warehouses	189	137	166	377	517	532	550
Wharves & docks	177	136	153	350	453	464	480
Coal & ore, wharves	174	136	153	341	445	457	470
Tel & Tel lines	157	121	129	250	356	358	364
Sgnls & intrlocks	169	130	143	226	347	351	356
Power plants	186	138	167	386	537	552	571
Powr trnsmissn sys	176	143	148	266	402	410	422
Misc structures	186	141	161	378	510	527	545
Roadway mach	156	138	170	280	411	427	447
Roadway small tools	190	155	180	315	520	540	554
Public impr const	169	131	142	321	397	403	405
Shop mach	197	163	207	322	486	511	521
Power plant mach	165	138	178	242	378	397	405
Work equipment	180	165	200	348	503	530	544

* Ratio is per cent of accounts included in road construction to total of all accounts, at 1910-14 prices, computed in 1953. Indexes represent territorial index factors and are not for determining unit reproduction costs for individual roads.

Handy-Whitman Cost Indexes for Public Utilities

Whitman, Requardt & Associates, Baltimore

Building (1911-14 = 100)

(Complete Index reports 14 Items)
A relates to Reinforced Concrete Bldg.; B relates to Brick Bldg.

	Jul '26	Jul '32	Jul '39	Jul '42	Jul '45	Jul '49	Jul '57	Jul '58	Jan '59	Jul '59	Jan '60	Jul '60
North Atlantic Division												
A	213	159	207	253	260	433	676	688	694	710	711	718
B	229	173	214	250	265	421	616	633	639	652	656	665
South Atlantic Division												
A	215	164	205	267	275	453	712	721	729	746	755	761
B	228	176	211	262	277	431	639	653	660	675	682	691
North Central Division												
A	201	154	200	242	253	418	663	673	679	698	697	707
B	211	164	203	234	250	390	597	612	616	634	635	645
South Central Division												
A	191	144	187	236	243	412	630	641	647	662	663	675
B	204	154	191	227	238	382	578	594	600	613	615	628
Plateau Division												
A	197	149	194	235	239	397	625	636	637	649	652	653
B	210	163	200	227	233	395	573	549	552	585	587	602
Pacific Division												
A	190	148	192	241	248	415	644	655	660	683	679	692
B	197	156	193	231	242	385	578	596	601	623	625	642

Gas Plant (1911 = 100)

(Complete Index reports 25 Items)
A relates to Total Constr. & Equip.; B relates to Mech. Equip. Exclusive of Gas Holders.

	Jul '26	Jul '32	Jul '39	Jul '42	Jul '45	Jul '49	Jul '57	Jul '58	Jan '59	Jul '59	Jan '60	Jul '60
North Atlantic Division												
A	230	188	249	275	288	464	717	745	760	776	780	790
B	212	195	278	299	301	481	799	823	849	854	844	844
South Atlantic Division												
A	222	175	230	268	282	453	693	721	737	749	753	764
B	212	195	278	299	301	482	799	823	849	854	844	844
North Central Division												
A	218	178	232	254	269	434	672	694	706	719	721	730
B	212	195	278	299	301	481	799	823	849	854	844	844
South Central Division												
A	200	160	217	249	261	419	632	655	667	677	680	688
B	212	195	278	299	301	487	799	823	849	854	844	844
Plateau Division												
A	202	166	217	237	243	398	612	630	641	653	656	662
B	212	195	278	299	301	481	799	823	849	854	844	844
Pacific Division												
A	206	177	228	257	266	428	661	688	699	715	717	735
B	212	195	278	299	301	481	799	823	849	854	844	844

Electric Light & Power (1911 = 100)

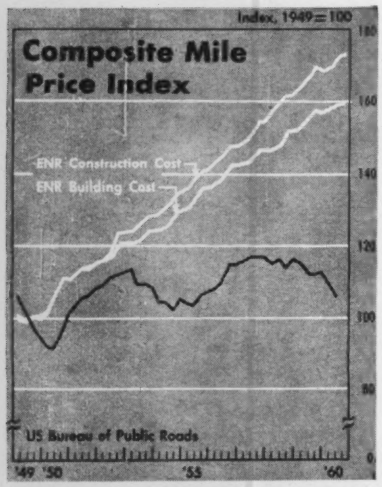
(Complete Index reports 64 Items)
A relates to Total Constr. & Equip. All steam; B to Accessory Electric Equipment; C to Sub-Sta. Equip.

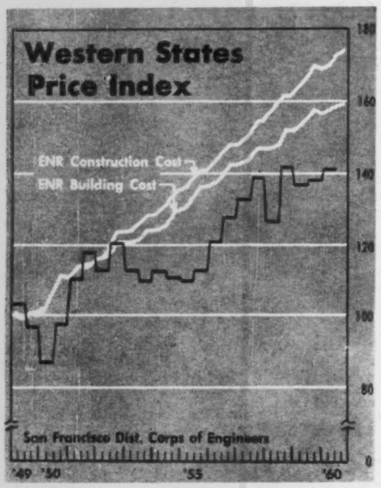
	Jul '26	Jul '32	Jul '39	Jul '42	Jul '45	Jul '49	Jul '57	Jul '58	Jan '59	Jul '59	Jan '60	Jul '60
North Atlantic Division												
A	194	176	225	248	259	400	610	627	635	641	635	641
B	196	186	224	239	237	341	519	543	545	548	517	518
C	178	168	203	216	218	312	464	484	485	487	471	475
South Atlantic Division												
A	201	180	233	267	273	422	651	667	678	685	677	683
B	203	191	240	262	248	356	546	564	571	576	545	543
C	183	173	218	237	228	325	491	506	510	515	499	500
North Central Division												
A	187	174	218	238	243	374	587	601	609	616	608	615
B	188	186	223	231	218	307	478	497	501	507	476	479
C	171	169	202	209	200	280	427	444	446	451	434	440
South Central Division												
A	183	171	218	246	251	390	601	617	623	629	621	629
B	189	190	230	248	235	340	517	539	543	547	516	519
C	171	173	209	226	217	311	457	476	478	482	466	471
Plateau Division												
A	188	171	219	236	241	378	594	604	612	623	614	618
B	196	188	232	236	225	323	494	509	513	526	494	496
C	177	171	211	212	207	294	442	453	455	467	450	454
Pacific Division												
A	178	163	215	242	244	380	590	608	617	625	618	630
B	177	170	222	240	225	323	495	520	528	537	508	516
C	161	155	202	219	208	297	451	473	480	487	473	483

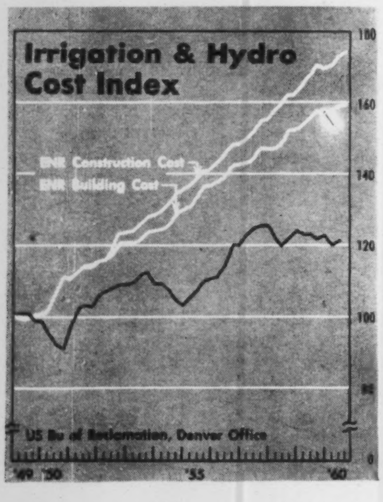
3rd Quarterly Cost Roundup

Heavy Construction Cost & Bid Price Indexes

Highway Bids Dip . . .







Bid prices on new highway and bridge jobs let in the second quarter dipped to the lowest in four years. The Bureau of Public Roads' Composite Mile Price Index for federal-aid projects throughout the country, edged down 0.5% to 159.1, based on average bid prices during 1925-29 as 100.

This was the second consecutive quarterly decline in the Composite Mile Index. However, the second quarter's drop was much less than the 2.7% drop in the first quarter of '60.

The smallness of the second quarter dip indicates that the over-all decline may not have been very general—that increases in a large number of states could have offset declines in others. Individual state highway department's price indexes tend to bear this out—of the 10 state highway price indexes reported to ENR (table above) five increased and five dropped in the second quarter.

Second quarter bid prices were down very slightly from the first quarter in Idaho, New York and Washington; off more in South Dakota and Texas. By contrast, bid prices rose in California, Colorado, Michigan, Nevada and Oregon. Moreover, the increases tended to be much greater than the decreases in these states.

"Costs are finally beginning to reflect the actual increases in wages, materials and cost of financing . . .," comments L. R. Gillis, California's Assistant State Highway Engineer. Contractor competition had been "more than sufficient" to offset the cost push. But contractor competition eased in the second quarter in California. The average number of bidders per job dropped to 5.8, compared to an average of 7.5 per project let during the first quarter.

Highway Bid Price Indexes

Computed by state highway

Base Year= 100:	California 1940	Colorado 1949	Florida 1950	Idaho 1950	Michigan 1940	Nevada 1955	New York 1940
1956 Av	247.3	92.8	122.2	118.3	185.4	118.2	252.2
1957 Av	264.3	97.3	127.2	116.1	173.0	124.3	268.5
1958 Av	236.5#	96.1	126.2	96.4	171.4#	113.3	257.2#
1959 Av	244.0	92.9	129.3	93.6	163.7	104.6	230.3
Q1..	216.1	97.2	135.4	108.9	163.0	110.0	246.7
Q2..	270.4	92.5	130.1	88.4	164.1	102.4	226.8
Q3..	260.3	89.3	126.2	77.5	163.8	105.7	229.6
Q4..	229.1	93.0	129.3	99.6	163.2	106.2	217.9
1960:							
Q1..	219.8	88.1	114.1	103.8	170.8	101.2	246.3
Q2..	251.6	92.8	.....	103.6	.....	111.0	.....

ENR average of quarterly indexes

. . . But Bids Firm on Other Work

Contractors' bid prices for heavy construction jobs let in western states broke upward in the first half of this year. This is apparent in the 2.1% increase in the Contract Unit Price Index computed by the Estimates Section, San Francisco District Corps of Engineers.

The latest value of this semi-annual index is 180.32, which is exceeded only by the record 182.02 in the second half of 1958. (The index is based on first half 1946 as 100.)

Sharp price increases in average unit prices bid on structural concrete, pavement concrete, roadway excavation, aggregate and piling offset lower bid prices on many bid items. On the downside were plant mix aggregate and plant mix asphalt, crushed rock base course, reinforcing steel, structural excavation and portland cement. Average prices of flat wheel rolling skidded to the lowest since 1957 (see table at right).

This 1960 reversal of the 1959 drop in the Contract Unit Price Index received confirmation from the U.S. Bureau of Reclamation's Composite Construction Cost Index. BuRec's quarterly index, covering mainly irrigation and hydro power construction in 18 western states including Alaska, edged up 0.8% to 1.27 in July (based on 1949-51 = 100).

Higher costs of irrigation and hydro power plants in July offset a 4.2% decline in earth dam construction costs, according to BuRec sub-indexes.

Canal construction costs climbed 4.7% between April and July, while the cost of laterals and drains rose 4.1%. Increased earthwork costs supplied the greatest upward pressure on costs of both these types of work.

Hydro power plant structure costs edged up 1.6%, but a 1.2% dip in equipment costs helped keep the over-all power plant cost index steady in July. By contrast, pumping plant structure costs rose 1.4% and equipment costs added to the upward pressure by creeping 0.6% higher in July.

A few types of work showed little or no change between April and July—concrete dams, diversion dams and transmission lines.

in 11 States

—US Composite Mile-Price Index—

departments				By public roads				Structures					ENR
Oregon	South Dakota	Texas	Washington	Common Excavation Price	Common Excavation Index	Concrete Surfacing Price	Concrete Surfacing Index	Reinf. Steel Price	Struct. Steel Price	Struct. concr. Price	Combined Index	Composite Mile Index	Construction Cost Index
1940	1940	'49–'53	1940	$0.35†	'25–'29	$2.22†	'25–'29	$0.052†	$0.067†	$22.15†	'25–'29	'25–'29	'25–'29
193.8	198.8	105.0	214.1	0.38	108.2	3.89	175.5	0.131	0.202	54.33	253.8	163.3	334.6
187.8	205.6	108.2	226.4	0.40	113.5	4.02	181.2	0.137	0.218	56.92	267.0	170.0	349.8
172.1#	184.5	115.9#	211.1#	0.39	112.5	4.02	181.1	0.130	0.193	54.92	253.3	167.5	366.8
176.3	204.4	111.0	194.0	0.38	109.1	3.99	179.9	0.127	0.184	53.42	246.5	164.6	385.07
201.4	216.9	117.0	189.0	0.40	113.4	4.02	181.3	0.128	0.187	54.93	251.2	167.6	377.55
165.4	194.1	112.1	194.6	0.37	104.8	4.03	181.7	0.125	0.182	51.90	240.7	163.1	383.84*
165.4	215.5	108.4	196.9	0.38	108.6	3.94	177.6	0.126	0.183	54.05	247.1	163.4	392.25*
172.8	191.2	106.5	195.4	0.38	109.4	3.97	179.0	0.130	0.184	52.80	246.9	164.4	390.12*
167.3	208.2	110.9	192.8	0.36	103.7	3.89	175.4	0.124	0.182	52.75	242.6	159.9	392.97*
.....	195.8			0.37	105.7	3.89	175.4	0.124	0.170	50.30	233.1	159.1	399.44*

† Average for 1925–29 base period * Last month of quarter

Western States Contract Unit Price Indexes

1st. Half 1946 = 100

Estimates Section, San Francisco District, Corps of Engineers,

		1946	1949	1955	1956	1957	1958		1959		1960
		1st half	1st half	1st half	1st half	1st half	1st half	2nd half	1st half	2nd half	1st half
Index. 1st Half '46 = 100		100.0	132.2	141.37	154.74	170.37	163.07	182.02	176.18	176.58	180.32
Items used in index	Unit	Based on these average unit prices									
Cr rock base course	ton	2.81	2.29	3.03	3.48	3.41	3.65	2.69	3.35	3.03	2.42
Plant mix aggregate	ton	4.82	4.43	5.86	6.19	6.92	7.28	6.83	6.97	7.84	7.27
Plant mix asphalt	ton	22.00	26.85	25.00	21.74	21.50	25.19	23.00	21.00	26.00	24.10
Cover aggregate	ton	5.09	5.65	6.63	6.60	7.13	7.02	6.96	6.84	6.95	7.60
Structural concrete	cy	50.65	65.07	67.00	72.00	82.00	79.00	84.00	82.00	82.00	89.00
Pavement concrete	cy	13.20	19.69	22.00	24.00	23.00	20.00	28.00	22.00	24.00	31.00
Reinforcing steel	cwt	9.60	12.70	13.00	13.00	17.00	17.90	18.00	16.00	16.00	14.00
Cement	bbl	2.84	4.98	4.68	5.04	5.11	5.00	5.18	4.83	4.87	4.78
CM pipe 12"	lf	2.20	3.03	3.60	3.98	4.48	4.33	4.52	4.30	4.59	4.45
CM pipe 24"	lf	4.05	5.26	6.84	6.60	8.04	7.56	7.87	7.97	8.08	7.77
RC pipe 18"	lf	3.30	4.27	5.15	5.91	6.24	6.38	6.58	6.71	6.87	6.46
RC pipe 36"	lf	8.29	10.47	11.62	11.86	13.75	12.72	13.20	14.52	14.61	13.46
VC pipe 6"	lf	1.87	2.39	2.75	3.50	3.70	3.31	3.90	3.67	3.63	3.58
VC pipe 8"	lf	2.22	2.80	3.36	3.99	3.67	4.01	4.65	4.65	4.46	4.01
Sewer manhole	1/10 ea	16.50	20.80	23.70	24.90	28.20	27.40	30.00	29.40	27.70	28.90
Roadway excavation	cy	0.67	0.96	0.80	0.92	1.05	1.09	1.15	2.11	0.97	1.12
Structural excavation	cy	2.49	4.27	3.78	3.63	5.42	3.78	4.25	4.16	4.62	4.04
Watering	M gal	2.13	2.13	1.71	1.76	1.92	1.86	1.86	1.85	1.95	1.78
Flat wheel roller	R-hr	5.47	7.82	8.50	8.15	10.06	11.31	11.00	11.00	14.21	10.98
Piling, green wood, fur	lf	0.64	0.65	1.17	1.35	0.895	1.09	0.88	1.00	0.93	1.03
Piling, treated, fur	lf	1.25	1.45	1.84	2.00	2.75	1.77	2.07	2.16	2.07	2.14
Timber in place	100 fbm	16.60	26.33	32.10	45.20	50.50	39.30	58.30	59.80	52.70	54.30
2" Galv steel pipe	lf	1.04	1.38	1.65	1.60	1.62	1.67	1.66	1.40	1.56	1.80
Cast-iron pipe 6"	lf	2.86	4.17	4.36	4.54	5.42	5.40	6.29	5.05	5.59	5.26
Cast-iron pipe 8"	lf	3.80	6.47	4.80	5.23	6.07	6.27	7.55	6.03	5.93	6.74
Gate valve 6"	1/10 ea	7.06	9.70	8.85	12.50	10.08	11.50	12.10	12.40	10.80	11.20
Total in dollars		193.65	256.01	273.78	299.67	329.93	315.79	352.49	341.18	341.96	349.19

Irrigation, Hydro Cost Indexes

US Bu Reclamation, 1949-51 = 1.0

	July					1959				1960		
Class of Construction	1940	1946	1949	1957	1958	Jan	Apr	Jul	Oct	Jan	Apr	Jul
Composite Index	0.47	0.78	1.04	1.29	1.24	1.28	1.27	1.27	1.26	1.27	1.24	1.25
Dams, earth	0.51	0.85	1.08	1.22	1.10	1.12	1.12	1.12	1.12	1.13	1.10	1.07
Dam structure	....	....	....	....	....	0.99	0.99	0.99	0.99	0.99	0.95	0.91
Spillway	....	....	....	....	....	1.27	1.27	1.27	1.26	1.28	1.25	1.23
Outlet works	....	....	....	....	....	1.34	1.34	1.35	1.34	1.36	1.35	1.35
Dams, concrete	0.47	0.76	1.02	1.15	1.12	1.13	1.13	1.13	1.13	1.14	1.12	1.12
Dams, diversion	....	....	....	....	....	1.37	1.39	1.37	1.39	1.39	1.39	1.39
Pumping plants, building & equip	0.48	0.73	1.00	1.46	1.42	1.47	1.47	1.48	1.48	1.48	1.44	1.46
Structure, rein conc, & improv	0.53	0.70	1.00	1.34	1.32	1.33	1.33	1.33	1.33	1.34	1.29	1.31
Equipment	0.56	0.78	0.97	1.58	1.60	1.65	1.66	1.67	1.70	1.70	1.70	1.71
Pumps & prime equipment	....	....	0.97	1.66	1.68	1.73	1.75	1.76	1.78	1.78	1.78	1.79
Accessory e'ec & misc equip	....	....	0.97	1.20	1.44	1.50	1.50	1.51	1.54	1.55	1.55	1.56
Steel penstocks, discharge pipes	....	....	0.96	1.72	1.63	1.72	1.74	1.75	1.77	1.77	1.77	1.78
Canals	0.47	0.78	1.07	1.21	1.13	1.13	1.12	1.12	1.11	1.11	1.06	1.11
Earthwork	....	....	....	....	....	1.09	1.06	1.06	1.06	1.06	1.01	1.06
Structures	....	....	....	....	....	1.24	1.19	1.14	1.16	1.16	1.12	1.16
Conduits (tunnels, conc-lined)	....	0.71	1.02	1.29	1.28	1.29	1.28	1.28	1.26	1.26	1.24	1.26
Laterals & drains	0.41	0.74	1.02	1.32	1.27	1.32	1.30	1.30	1.28	1.28	1.23	1.28
Earthwork	....	....	....	....	....	1.11	1.05	1.05	1.00	0.97	0.92	0.97
Structures	....	....	....	....	....	1.59	1.52	1.50	1.46	1.46	1.41	1.46
Power plants, hydro, bldg & equip	0.51	0.77	0.99	1.47	1.44	1.51	1.51	1.52	1.52	1.52	1.50	1.50
Structure, rein conc, & improv	0.45	0.71	1.01	1.33	1.33	1.34	1.34	1.34	1.34	1.34	1.29	1.31
Equipment	0.55	0.81	0.93	1.55	1.58	1.61	1.62	1.63	1.65	1.65	1.65	1.63
Turbines & generators	0.56	0.83	0.94	1.58	1.60	1.64	1.66	1.67	1.68	1.68	1.68	1.65
Accessory electrical equip	0.54	0.72	0.98	1.48	1.49	1.52	1.52	1.53	1.56	1.56	1.56	1.56
Miscellaneous equipment	0.51	0.73	0.98	1.44	1.40	1.44	1.45	1.46	1.48	1.49	1.49	1.50
Concrete pipe lines	....	....	0.98	1.28	1.32	1.33	1.35	1.36	1.36	1.36	1.36	1.36
Switchyards & substations	0.54	0.70	0.94	1.60	1.56	1.61	1.62	1.63	1.64	1.65	1.63	1.65
Transmission lines—												
Wood-pole, 115-kv	0.52	0.99	1.16	1.10	1.21	1.23	1.21	1.23	1.23	1.25	1.28	1.28
Poles and fixtures	....	....	....	....	....	1.10	1.13	1.16	1.09	1.12	1.13	1.13
Overhead conductors, devices	....	....	....	....	....	1.34	1.34	1.34	1.34	1.35	1.39	1.39
Steel-tower, 230 kv	....	....	....	1.43	1.40	1.44	1.44	1.45	1.46	1.46	1.48	1.48
Primary roads	0.48	0.82	1.06	1.25	1.21	1.24	1.25	1.25	1.24	1.25	1.25	1.25
Secondary roads (unsurfaced)	0.50	0.91	1.08	1.21	1.18	1.19	1.20	1.20	1.17	1.18	1.17	1.16
Bridges, steel	0.46	0.78	1.03	1.52	1.44	1.48	1.48	1.48	1.48	1.48	1.46	1.48
General property—buildings	0.44	0.66	0.93	1.31	1.32	1.35	1.36	1.38	1.40	1.40	1.40	1.41

POWER-PACKED
AIR-COOLED
DEUTZ DIESELS
PUT PUNCH
IN THESE
TRACTOR LOADERS!

Michigan 85D Loaders with Air-Cooled Deutz Diesel A6L514

At a bitter −40° or at a fearful +140°F, the Deutz air-cooled diesel delivers full power output to these loaders in less than 5 seconds from start. There's never a winter freeze-up; no disappointing hot-weather performance. Eliminating the water system cuts mechanical breakdowns, reduces maintenance, gives you the full horsepower rating of the engine. With air-cooling you run at higher head temperatures, condensation of corrosive sulphurous acids ends, downtime is reduced. Higher head temperatures squeeze every ounce of work out of the fuel.

Many Models, many uses. Deutz diesels range from 5 to 250 HP in 1, 2, 3, 4, 6, 8, and 12 cylinder models. When you're buying new equipment, make sure it's Deutz-powered. And check your present equipment — graders, concrete mixers, sweepers, generators, compressors. See whether it won't pay to convert to Deutz now.

For further information send coupon.

DEUTZ

DIESEL ENERGY CORP.
82 Beaver St.,
New York 5, N. Y.

EN-R4

Please mail me your literature on your Air-Cooled Diesels.

☐ Industrial Use ☐ Construction Use

Name ....

Address ....

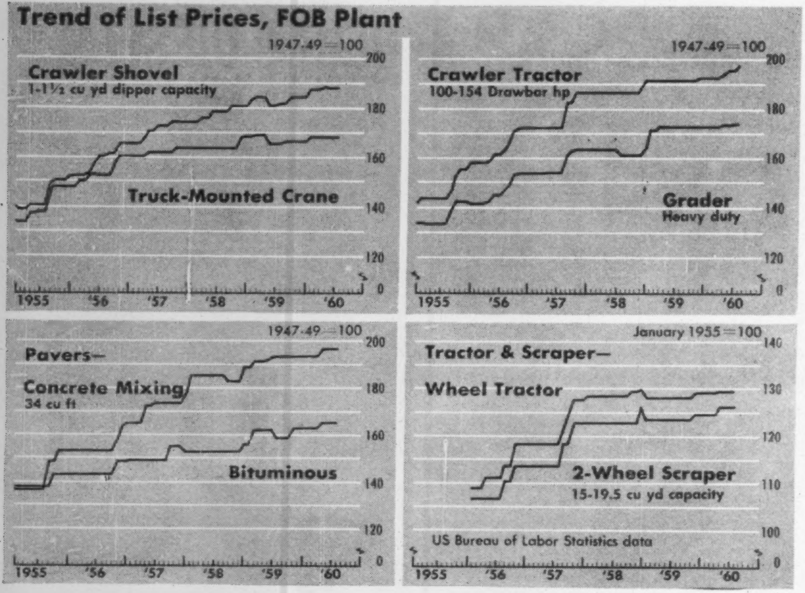
City ....Zone........State............

CIRCLE 69 ON READER SERVICE CARD

3rd Quarterly Cost Roundup

Basic Cost Factors

Why the



MACHINES: A Few Hikes Raise the Average

List prices of new equipment are nearly as steady this year as last. But scattered price increases keep the average trend tilted upward.

As of July 15 (latest available as we go to press), list prices averaged out at a record high. The Bureau of Labor Statistics index of 175.5, based on average prices during 1947-49 as 100, was 1.5% higher than on December 15, 1959. This is slightly more than the 1% increase in the first 7 months of last year.

Stiff sales competition among equipment makers and steady steel prices have helped steady list prices this year. But because production rates are down and labor costs are up, profit margins are suffering. So any increase in steel prices a few months from now would trigger more widespread increases in factory prices of new construction equipment, particularly if the soaring volume of construction contracts brings a surge in contractors' buying.

BLS indexes show that prices have increased on a selective basis and that one or more models have gone up in price in nearly all types of equipment. Indexes for crawler power shovels are up for most size ranges listed. But truck-mounted crane prices are steady. Four-wheel scrapers are unchanged but two-wheel models are up a shade. Off-highway rubber tired tractors are virtually unchanged, but some crawler tractor prices are up in the 50-120 drawbar hp range.

Equipment List Price Indexes

Bureau of Labor Statistics, 1947-49=100

	July 15		Change (July to July) %	
	1960	1959	'59-'60	'58-'59
All Types of Equipment	175.5	172.0	+2.0	+3.9
Cranes, Draglines, Shoves	173.4	168.6	+2.8	+2.9
Shovel, ½ cy	167.9	163.3	+2.8	+6.0
Shovel, ¾ cy	175.4	172.5	+1.7	+2.9
Shovel, 1-1½ cy	188.2	181.9	+3.5	+2.0
Shovel, 2-2½ cy	170.3	162.1	+5.1	+5.0
Shovel 3-3½ cy	167.8	167.8	0	+3.1
Shovel, 6 cy	197.9	190.5	+3.9	+5.8
Crane, truck mounted	168.2	165.7	+1.5	+0.9
Crane, tractor mounted	135.1	135.1	0	0
Bucket, clam shell	162.9	157.5	+3.4	+3.1
Bucket, dragline	169.3	169.3	0	−6.4
Scrapers and Graders	166.6	165.7	+0.5	+4.3
Scraper,				
4-wheel, 8-10.5 cy	155.0	155.0	0	0
4-wheel, 12-15 cy	156.8	156.8	0	+3.6
2-wheel, 15-19.5 cy (a)	126.2	123.7	+2.0	+0.8
Grader, heavy duty	174.0	172.6	+0.8	+5.2
Grader, light medium	171.1	171.1	0	+6.1
Tractors (non-farm)	192.0	187.8	+2.2	+4.0
Wheel-type, off-hwy (a)	129.2	128.2	+0.8	−0.2
Crawler under 49 dhp	194.0	188.8	+2.8	+5.4
50-74 dhp	200.4	191.9	+4.4	+5.1
75-99 dhp	201.2	196.4	+2.4	+5.7
100-154 dhp	197.3	191.3	+3.1	+2.5
155-200 dhp	203.3	201.3	+1.0	+5.0
Machinery, Tractor Mtd	169.5	168.6	+0.5	+4.3
Dozer, cable control	154.4	154.4	0	+1.8
Dozer, hydraulic control	186.6	186.6	0	+5.2
Cable power control unit	152.9	151.4	+1.0	+2.4
Loader, shovel type	163.2	161.5	+1.1	+4.9
Specialized Machinery	158.7	155.7	+1.9	+3.3
Ditcher	153.8	156.6	−1.8	+1.6
Roller, tandem	226.4	209.8	+7.9	+8.6
Roller, 3 wheels	178.7	174.9	+2.2	+8.2
Ripper and rooter	156.6	150.5	+4.1	+5.0
Dewaterg pump, 10 Mgph	111.5	110.0	+1.4	−1.5
Dewaterg pump, 90 Mgph	151.5	150.5	+0.7	+4.3
Portable Air Compressors	167.5	167.5	0	+5.3
Capacity, under 200 cfm	173.2	173.2	0	+5.8
Capacity, over 200 cfm	162.4	162.4	0	+5.0
Contractors Air Tools	181.6	181.6	0	+10.4
Mixers, Pavers, Spreaders	161.8	156.1	+3.7	+4.0
Mixer, portable, 11 cf	166.8	165.0	+1.1	+3.1
Mixer, portable, 16 cf	172.7	169.8	+1.7	+3.7
Mixer, truck, 6 cy	135.1	132.4	+2.0	+4.0
Mixer, Paving, 34 cf	196.7	193.5	+1.7	+4.5
Concrete finisher, & spdr	201.9	190.4	+6.0	+4.9
Bituminous distributor	126.2	122.3	+3.2	0
Bituminous spreader	179.4	170.2	+5.4	+6.2
Bituminous paver	165.6	159.3	+4.0	+4.1
Off-Highway Vehicles (b)	102.5	101.1	+1.4	+1.2
truck (b)	102.0	101.1	+0.9	+1.2
Trailer dump wagon (b)	106.7	101.4	+5.2	+1.4

(a) January 1955=100 (b) January 1958=100

MATERIALS: Down or

Stable or lower building materials prices continued to relieve the labor cost pressure on contractors in the third quarter of 1960.

Structural steel mill prices held steady throughout the past three months. But major steel service centers continued to trim structural shape warehouse prices. Smaller steel suppliers offered shapes at still lower prices in an aggressive bid for contractors' business.

Rebar prices held steady in most of ENR's 20-cities in the third quarter. However, price cuts in Chicago and St. Louis pulled ENR's 20-cities average of rebar prices 0.3% lower to \$8.294 per Cwt. Imported bars were available at good sized discounts, but this competition was less aggressive this quarter because European manufacturers "cooperated" in "stabilizing" prices of bars sent to the U.S. Moreover, heavy European consumption cut down the imported tonnage available here. "Buy American" clauses in some contracts also limited competition from rebar imports.

The downtrend in Douglas fir lumber prices got steeper since June. ENR's U.S. average of prices contractors pay local dealers for fir 2x4s slid off 2.3% to \$117.58 per Mbf this month. Southern pine lumber prices also softened because of stiff price competition from fir. This was true even in the deep South, home of the pine industry.

Recently mill prices of fir lumber have firmed up, reflecting reductions in mill inventories. However, lumber mill orders, as measured by ENR's Lumber Demand Indicator (chart), are lagging, probably because local stocks are ample. For the most part, local yards are absorbing the higher mill prices. And dealers in several major construction centers are trimming prices in the face of stiff competition for contractors' business.

Plywood sheathing prices were weak throughout most of the third quarter. Prices of ⅝-in. CD panels dipped 5.4% to \$89 per Msf in August, fob Northwest mills. However, in recent weeks, production cutbacks have boosted prices to \$92.

Also on the downside this quarter were gypsum and fibreboard sheating; mineral wool insulation, line; structural clay tile, concrete and clay sewer pipe and crushed stone.

Brick prices are slightly higher than in June.

1960 Cost Push Is Losing Steam

Steady to Date

Explosives are a notable exception to the downtrend in materials prices. A $1 per Cwt boost for 40% Ammonia gelatin pushes ENR's 20-cities explosives price average up 3.6% to .28655 per lb.

Looking ahead, contractors need not worry about higher structural steel prices over the near term. In the face of heavy warehouse inventories, steel mills would find it pretty hard to pass along their increased labor costs in the form of higher mill prices for structurals in December.

However, as 1960's heavy construction boom nears the turn into 1961, a mill price increase might loom ahead. Stocks are likely to drop while wage costs will rise in December.

Cement may cost more in 1961. Deferred wage increases for cement mill workers will cut into producers earnings, which were poor this year because of the lag in demand. The cement companies may attempt to boost 1961 earnings by mill price increases in areas where foreign competition is not a factor.

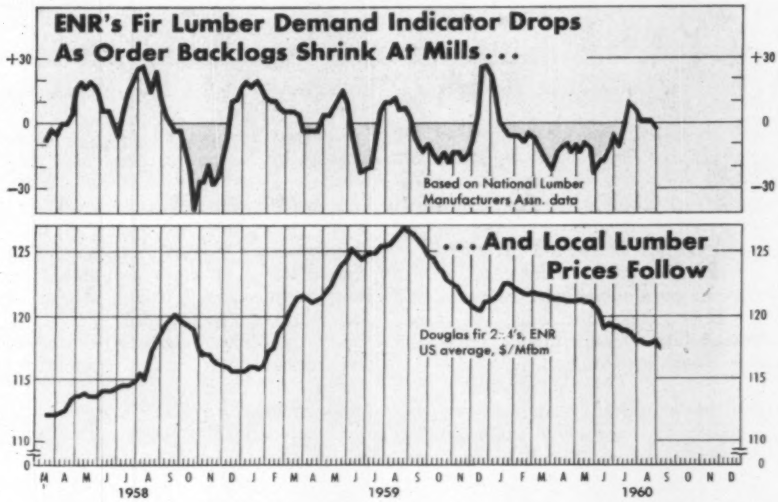
Another factor in favor of a 1961 round of cement price boosts is a recent amendment to the U.S. Internal Revenue Code forcing cement producers to base their depletion allowance on kiln feed rather than on finished cement (ENR, July 7, '60 p. 79). The head of one major East Coast cement producer says that this will take 60-80 cents out of his company's per-share earnings. There just isn't anyway for the cement companies to offset this reduction in earnings except by higher prices.

Lumber prices are headed higher in 1961. There may be some further price weakness over the near term. But when the near-record 1960 mass housing contract awards begin to show up in increased housing starts, a sharp upswing in lumber orders and higher prices could result.

Passage of higher minimum wage legislation in the next session of Congress would almost certainly lead to a boost in pine lumber prices.

Plywood prices will be firm next quarter.

One major producer recently boosted ⅝" CD sheathing prices $2 to $94 per Msf, fob mill. However, other manufacturers continue to list this grade at $92 per Msf and demand is brisk at that price. Any upswing in housing starts this fall could trigger plywood price increases.



ENR's Fir Lumber Demand Indicator Drops As Order Backlogs Shrink At Mills . . .

. . . And Local Lumber Prices Follow

MONEY: Borrowing Costs Go Down

The 1960 decline in interest rates on long-term borrowing to finance construction continued in the third quarter.

And developments in August point to a dip in the cost and increased supply of short-term bank loans to contractors. A ½% drop in the Federal Reserve Banks' discount rate (Dallas this month is the last of the 12 Federal Reserve Districts to do so) led to a ½% cut in the prime rate, the rate commercial banks charge their gilt-edge customers.

Moreover, banks in Chicago and New York are allowed effective September 1 to make a larger volume of loans per dollar of reserves that they have on deposit with the Federal Reserve Bank.

This first installment of a gradual reduction in their reserve ratios, would allow these banks to expand their business loans by hundreds of millions more than they otherwise could, if and when loan demand increases.

Lower long-term rates make it easier for contractors' customers to obtain financing.

For example, New York State and some school districts, figure that the recent lower rates have saved them a great deal in financing costs. And to the extent that bank rates are scaled down, contractors can benefit directly from lower costs of construction and equipment loans.

Borrowing Cost Trends

Long-Term Bonds*

Year	US Treas. %	Municipal %	Industrial %	Public Utility %	Railroad %
	(Per cent yield to maturity)				
1929	3.60	4.27	5.04	4.96	4.67
1931	3.34	4.01	4.79	4.57	4.42
1939	2.41	2.76	2.64	2.83	3.39
1945	2.34	1.67	2.50	2.59	2.75
1946	2.19	1.64	2.44	2.50	2.59
1949	2.28	2.21	2.53	2.69	2.71
1951	2.60	2.00	2.72	2.90	2.89
1957	3.47	3.60	3.80	3.99	3.94
1958	3.23	3.56	3.65	3.86	3.89
1959 Aver	**4.10**	**3.95**	**4.25**	**4.49**	**4.41**
May	4.06	3.97	4.27	4.49	4.38
Dec	4.42	4.05	4.45	4.65	4.66
1960: Mar	4.11	3.87	4.34	4.51	4.55
Apr	4.17	3.84	4.28	4.50	4.55
May	4.15	3.85	4.29	4.54	4.54
Jun	3.93	3.78	4.30	4.55	4.47
Jul	3.78	3.72	4.25	4.48	4.44
Aug	....	....	....	....	....

Short-Term Business Loans#

Year	New York City %	7 Other Northern & Eastern Cities %	11 Southern & Western Cities %
1929	5.76	5.82	5.93
1931	3.82	4.26	4.90
1939	2.15	3.05	3.62
1945	2.20	2.55	2.80
1946	1.84	2.51	2.97
1949	2.35	2.86	3.17
1957	4.23	4.39	4.65
1958: Mar	4.29	4.49	4.77
Jun	3.88	4.17	4.58
Sep	4.00	4.21	4.54
Dec	4.29	4.50	4.79
1959: Mar	4.29	4.49	4.84
Jun	4.71	4.90	5.07
Sep	5.15	5.27	5.44
Dec	5.19	5.39	5.56
1960: Mar	5.18	5.34	5.57
Jun	5.19	5.34	5.58

* Standard & Poor's data: Taxable Treasury bonds (Federal Reserve Bd. series on partially tax exempt bonds shown for years 1929-39 had 1945 value of 1.66%); high grade municipal bonds; A1+ grade industrial, utility and railroad bonds.

#Federal Reserve Board data for June. New Series 1949 to date; two former series cover up to 1938 and 1939-48 and are not strictly comparable.

3rd Quarterly Cost Roundup

Costs 'Round the World

World

The U. S. pattern of rising wages and stable or lower materials prices prevails in many other countries of the world this year.

With a few notable exceptions in Asia and the Near East, construction workers are receiving higher pay scales in 1960. By contrast, many countries had excellent results in holding down prices of key construction materials.

In Europe stable or lower materials prices in most major construction centers helped take the edge off wage boosts. Only Spain saw a break in wage labor cost inflation.

Contractor's bid prices naturally reflect the European wage uptrend. In England, "The Builder" newspaper's cost index, based on "tenders," rose 2.2% to 273 (1939 = 100) as of May, 1960. This rise reflects not only wage hikes, but the boom in England's construction market.

Contractors operating in Lebanon, Turkey and Egypt had good news this year. Not only are wage rates lower than in 1959, but key construction materials prices are also lower in these countries.

By contrast, a wave of inflation hit Iraq, Morocco and Israel, where all wages and materials prices are higher this year. The Israeli government's construction cost index (see chart) climbs 3.8% to a record 502 in April, 1960, based on July 1, 1950 = 100.

The inflation express was derailed in the Far East. Wage rates are unchanged this year and materials prices are stable or lower in most major construction centers.

Closer to home, Latin American construction costs are generally higher this year, spurred by higher wages. In contrast with the rest of the world, there's a broad uptrend in construction materials prices in these countries.

Latin American areas showing the most consistent cost inflation this year are Puerto Rico, Mexico and Peru. Venezuela, Colombia and Argentina had a measure of success in holding back the wage/price steamroller. The Argentine "Construction Chamber's" construction cost index rose only 0.08% in 1960 to 485.4 (1939 = 100). In 1959 this index soared 84%.

Construction Materials Prices Around the World

Latin America . . .

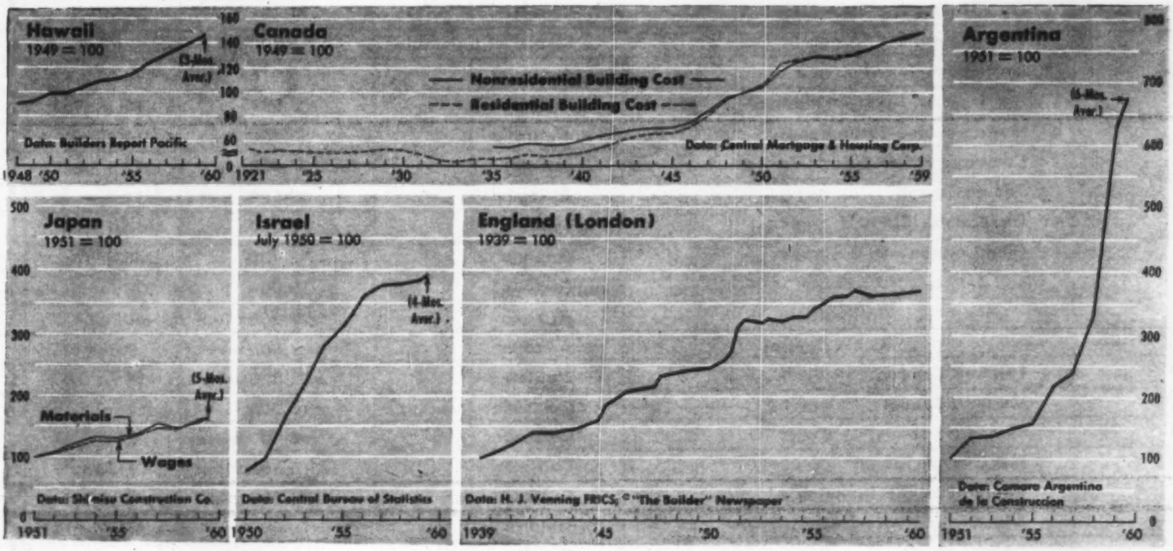
	San Juan (Puerto Rico) 1959	San Juan (Puerto Rico) 1960	Mexico City (Mexico) 1959	Mexico City (Mexico) 1960	Caracas (Venezuela) 1959	Caracas (Venezuela) 1960	Bogota (Colombia) 1959	Bogota (Colombia) 1960	Lima (Peru) 1959	Lima (Peru) 1960	Sao Paulo (Brazil) 1959	Sao Paulo (Brazil) 1960	Brazilia (Brazil) 1959	Brazilia (Brazil) 1960
Currency Unit:	U. S. Dollar		Peso		Bolivar		Peso		Soles		Cruzeiro		Cruzerio	
MATERIALS:					G		E							
Structural Steel Shapes	9.50d	10.00d	2,100Bac	2,500Bac	600–650Bb	700–1,000Bb	1,200B	1,350B	5.70E	5.95E	49.00E	33.00	....	.....
Reinforcing Steel Bars	4.65d	6.75d	1,900BG	1,950BG	490–500BC	490Bc	1,000B	965B	4.85E	5.10E	27.50E	26.20E	....	25.1Ea
Portland Cement	0.95b	1.05b	240B	270B	107B	107B	117B	130B	22.54a	23.68a	240.00H	256.00H	....	315.0H
Lumber: 1st Class Pine 2"x4"	105.00F	150.00F	2,200kG	2,900kG	260C	290C	.....	.....	5.00m	5.20m	5.80gh	6.20gh	....	.....
2nd Class Pine 2"x4"	97.00F	120.00F	1,900kG	2,400kG	240C	280C	.....	.....	4.30m	4.70m	4.90gh	.....	....	42.0gi
Other	.....	.....	.....	.....	150Co	290Co	.....	14.00p	4.60mn	4.00mn	.....	.....	....	35.0gj
Grave	4.25Cd	4.25Cd	25CaG	30CaG	18Ce	12Ce	.....	33.00B	18.00Cc	28.00Cc	480.00Cb	650.00Cb	....	1,150.0Cb
Sand	1.95Cb	2.05Cb	25CaG	30CaG	17Ca	15Ca	.....	20.50Ba	18.00Cb	28.00Cc	320.00Cb	350.00Cb	....	850.0Cb
LABOR:														
Common Labor:														
Heavy Construction	0.70	0.85	87.50bc	101.50bc	15.17ac	15.17ac	8.64a	12.00a	55.80a	59.52a	31.80	31.85	....	28.0
Building	0.69	0.83	87.50bc	136.50bc	15.17ac	15.17ac	14.40a	9.00a	55.80a	59.52a	31.80	31.85	....	28.0
Skilled Labor														
Bricklayers	1.12	1.34	175.00bc	210.00bc	25.67ac	25.67ac	13.60a	10.00a	80.60a	84.68a	58.50	67.60	....	42.0
Carpenters	1.12	1.34	210.00bc	245.00bc	25.67ac	25.67ac	13.60a	12.75a	80.60a	84.68a	50.70	50.70	....	.....
Structural Ironworkers	1.14	1.37	280.00bc	315.00bc	25.67ac	25.67ac	16.00a	12.75a	117.80a	120.76a	50.70	.....	....	.....
VALUE IN U. S. CURRENCY														
Official exchange rate	$1.00	$1.00	$0.0800	$0.0800	$0.300	$0.300	$0.146	$0.147	$0.0333	$0.0364	$0.053	$0.053	....	$0.053
Free market rate	.....	.....	$0.0800	$0.0800	$0.300	$0.300	$0.126	$0.147	$0.0333	$0.0364	$0.0054	$0.0054	....	$0.0054

Europe . . .

	Buenos Aires (Argentina) 1959	Buenos Aires (Argentina) 1960	London (England) 1959	London (England) 1960	Paris (France) 1959	Paris (France) 1960	Milan (Italy) 1959	Milan (Italy) 1960	Amsterdam (The Netherlands) 1959	Amsterdam (The Netherlands) 1960	Bonn (Germany) 1959	Bonn (Germany) 1960	Madrid (Spain) 1959	Madrid (Spain) 1960
Currency Unit:	Peso		Pound Sterling		Franc (old)		Lira		Florin		Deutschemark		Peseta	
MATERIALS:					G						G		G	
Structural Steel Shapes	18,000B	18,500B	43/10/0A	43/10/0A	79,040B	85,870B	7,100–7,700I	7,100–7,700I	472.50B	500.00B	470B	470B	14.00E	8.00E
Reinforcing Steel Bars	14,500B	14,500B	42/0/0A	42/0/0A	72,110B	77,790B	5,900–6,300I	5,900–6,300I	443.50B	493.50B	480B	480B	10.50E	7.50E
Portland Cement	2,130B	2,420B	5/12/0A	5/10/0A	10,076B	10,114B	1,180IG	925–1,075IG	60.00B	59.25B	74.50B	74.50B	856.00B	900.00B
Lumber: 1st Class Pine 2"x4"	215ls	188ls	110/0/0–135/0/0a	115/0/0–140/0/0a	41,035Cb	42,657Cb	52,000–54,000Cc	52,000–54,000Cc	......	......	265Cd	265Cd	5,100Cf	3,500Cf
2nd Class Pine 2"x4"	175ln	146ln	92/0/0–95/0/0a	94/0/0–98/0/0a	30,637Cb	30,899Cb	47,000–50,000Cc	47,000–50,000Cc	......	......	245Cd	245Cd	4,300C	2,500C
Other	220gl	195gl	......	......	......	......	......	......	195.00C	219.50C	220Ce	220Ce	......	......
Gravel	650C	620C	1/5/5D	1/3/8D	3,321C	3,011C	500–600C	500–650C	7.90B	8.21B	7.50C	7.00C	110.00C	130.00C
Sand	144Ca	150Ca	1/6/9D	1/6/9D	3,030C	2,884C	850–1,000C	900–1,050C	5.32B	5.59B	9.50C	9.50C	90.00C	90.00C
LABOR:														
Common Labor:														
Heavy Construction	283.90a	282.01a	0/4/2½d	0/4/4d	259.63	272.71	405.84	426.42	2.78	3.00	3.23	3.53	104.75a	74.88a
Building	283.90a	282.01a	0/4/2½d	0/4/4d	259.63	272.71	405.84	426.42	2.78	3.00	3.35	3.68	90.75a	74.88a
Skilled Labor														
Bricklayers	378.60a	376.02a	0/4/9d	0/4/11½d	446.20	468.62	503.91	537.86	2.78	3.00	3.67	4.01	104.75a	105.56a
Carpenters	378.60a	376.02a	0/4/9d	0/4/11½d	394.21	413.73	505.76	539.74	2.80	3.02	3.67	4.01	104.75a	105.56a
Structural Ironworkers	378.60a	376.02a	0/4/7d	0/4/9½d	417.95	438.34	503.91	537.86	2.35	2.56	3.52	3.85	308.55a	313.56ae
VALUE IN U.S. CURRENCY														
Official exchange rate	.....	.....	$2.80	$2.80	$0.00494	$0.00494	$0.00161	$0.00161	$0.2639	$0.2639	$0.2398	$0.2401	$0.0238	$0.0167
Free market rate	$0.011	$0.012	......	......	......	......	$0.00161	$0.00163	......	......	$0.2398	$0.2404	$0.0172	$0.0167

•A per long ton (2,240 lbs) •B per metric ton (2,204.6 lbs) •C per cubic meter •D per cubic yard •E per kilo (2.2046 lbs) •F per Mfbm G delivered to jobsite H per 50 kilo sack I per 100 kilo STRUCTURAL STEEL SHAPES: •a fob Monterey •b second price cut to size •c "I" beams 3"x3"x4' •d per 100 lbs REINFORCING STEEL BARS: •a ½" •b corrugated rods ⅜"x½"x11 meters or ¾"x1"x11 meters •c ⅝"-1½" •d per 100 lbs CEMENT: a per 42 kilo sack •b per 100 lb sack LUMBER: •a per standard (165 cu ft) •b Vosges lumber •c fir lumber •d pine lumber, 8x10 cm (3.15x3.94") •e Fichtenkantholz lumber 8x10 cm •f Balsain lumber •g per linear meter •h 1"x2" •i 3rd class pine 1"x12" unsized •j 3rd class pine 3"x3" unsized •k per 1,000 sq ft •l per sq meter •m per board ft •n cedar lumber •o Saquisaqui lumber •p per pieza (6 cmx30 cmx4 meter) •q Brazilian pine lumber 2"x12" 3rd class •r 3rd class pine 1"x6" •s 3rd class pine 3"x4" GRAVEL: •a blue •b #1 •c ¼" •d ½" •e crushed rock •f 1" •g 2" •h 2-3 cm underwater gravel SAND: a washed •b coarse •c fine LABOR (Rates include spcial charges where applicable): •a per 8 hr day •b per week •c extra day's pay for six days work •d add 8/3d social charges per week •e add .oor and travel allowance on distant jobs

Wages Up; Prices Steady



Africa . . .

Near East . . .

	Casablanca (Morocco)		Cairo (Egypt)		Tel Aviv (Israel)		Bagdad (Iraq)		Beirut (Lebanon)		Ankara (Turkey)		Kuwait	
	1959	1960	1959	1960	1959	1960	1959	1960	1959	1960	1959	1960	1959	1960
Currency Unit:	Moroccan Franc		Egyptian Pound		Israeli Pound		Dinar		Lebanese Pound		Turkish Lira		Rupee	
MATERIALS:					G		G		G		G		G	
Structural Steel Shapes	65,900*B*	69,400*B*	80–100*B*	75–95*B*	431.667*B*	470.000*B*	60.000*B*	110.000*B*	550*B*	550*B*	1,500*B*	1,600*B*	....	1.410*B*
Reinforcing Steel Bars	61,350*B*	74,300*B*	54–66*B*	54–79*B*	364.792*B*	410.000*B*	42.000/43.000*B*	53.000*B*	370B	375B	1,750*B*	1,750*B*	....	705*B*
Portland Cement	8,900*A*	8,955*A*	5.50*B*	5.50*B*	88.500*B*	88.500*B*	7.250*B*	7.500*B*	61*B*	58*B*	140*B*	130*B*	....	110*BL*
Lumber: 1st Class Pine 2"x4"	31,360*C*	35,800*C*	31*Ca*	36*Ca*	....	....	35.000*Ch*	105.000*Ch*	200*C*	225*C*	600*C*	750*C*	....	1,400*C*
2nd Class Pine 2"x4"	28,000*C*	35,000*C*	29.50*Ca*	33.50*Ca*	234.000*C*	275.000*C*	....	....	150*C*	175*C*	500*C*	600*C*	....	....
Other	28,880*C*	31,475*C*	....	....	218,148*C*	250.000*C*	25.000*Cg*	31.500*Cg*	....	....	....	....	....	420*Cg*
Gravel	1,000*Ca*	1,100*Ca*	0.70*Cb*	0.75*Cb*	4.684*C*	5.140*C*	1.250*Ca*	1.000*Ca*	7.50*Ca*	7.50*C*	33*C*	28*C*	....	15*C*
Sand	400*Cc*	450*Cc*	0.35*Cc*	0.30*Cc*	1.863*C*	2.200*C*	1.250*Cb*	1.000*Cb*	5*Ca*	5*Ca*	30*C*	28*C*	....	10*Cb*
LABOR:														
Common Labor:														
Heavy Construction	97.50	102.40	0.20*a*	0.20*a*	11.598*a*	12.151*a*	0.550*a*	0.800*a*	8*c*	8*c*	10.80*bd*	10.80*bd*	....	12*a*
Building	109.00	114.30	0.20*a*	0.20*a*	11.819*a*	12.382*a*	0.550*a*	0.800*a*	6*c*	6*c*	21.60*bd*	21.60*bd*	....	12*a*
Skilled Labor														
Bricklayers	168.00	175.20	0.80*a*	0.80*a*	13.879*a*	14.540*a*	1.900*a*	0.800*a*	12*c*	12*c*	21.60*bd*	21.60*bd*	....	43*a*
Carpenters	204.00	214.30	0.70*a*	0.70*a*	13.879*a*	14.540*a*	1.900*a*	0.800*a*	8–12*c*	12*c*	24.30*bd*	24.30*bd*	....	36*a*
Structural Ironworkers	234.00	246.30	0.80*a*	0.80*a*	13.879*a*	14.540*a*	2.250*a*	0.800*a*	12–15*c*	15*c*	21.60*bd*	21.60*bd*	....	33–43*a*
VALUE IN U. S. CURRENCY														
Official exchange rate	0.00238	0.00198	2.882	2.874	0.556	0.556	2.801	2.849	....	....	0.357	0.357	....	0.208
Free market rate	0.00227	0.00182	1.667	2.062	....	0.556	2.801	2.703	0.317	0.317	0.0725	0.0725	....	0.152

Asia . . .

	Bombay (India)		Columbo (Ceylon)		Karach (Pakistan)		Tokyo (Japan)		Manila (Philippine Islands)	
	1959	1960	1959	1960	1959	1960	1959	1960	1959	1960
Currency Unit:	Rupee		Rupee		Pakistan Rupee		Yen		Philippine Peso	
MATERIALS:			G				G			
Structural Steel Shapes	705*A*	705*A*	925*A*	925*A*	1,000*A*	1,400*A*	48,000*B*	45,000*B*	750*B*	800*B*
Reinforcing Steel Bars	695*A*	695*A*	875*A*	875*A*	798*AH*	798*AH*	40,000*B*	36,000*B*	450*B*	470*B*
Portland Cement	131.50*AI*	131.29*AI*	225*A*	225*A*	85/2/0*AHb*	85/2/0*AHb*	7,000*B*	6,600*B*	3.60*a*	3.15*a*
Lumber: 1st Class Pine 2"x4"	8*D*	8*D*	....	....	18/0/0*D*	16/0/0*D*	4,300*b*	4,400*b*	....	....
2nd Class Pine 2"x4"	6*D*	6*D*	....	....	15/0/0*D*	15/0/0*D*	3,900*b*	4,000*b*	....	....
Other	20*Da*	20*Da*	23*De*	22*De*	14/0/0*Dc*	12/0/0*Dc*	....	....	220*Fd*	200*Fd*
Gravel	0.32–0.43*EJ*	0.32–0.43*EJ*	18*A*	18*A*	55/0/0*Ed*	55/0/0*Ed*	1,450*Cb*	1,450*Cb*	5.50*C*	5.00*C*
Sand	0.42*EKb*	0.42*EKb*	5*Aa*	7*Aa*	24/0/0*Ea*	24/0/0*Ea*	970*Cc*	970*Cc*	4.50*C*	4.00*C*
LABOR:										
Common Labor:										
Heavy Construction	3*a*	3*a*	0.57½*e*	0.72¼*e*	0/6/0	0/6/0	680*a*	680*a*	0.5175	0.5175
Building	2.50*a*	2.50*a*	0.57½*e*	0.72¼*e*	0/5/0	0/5/0	600*a*	600*a*	0.5175	0.5175
Skilled Labor:										
Bricklayers	6.75*a*	6.75*a*	0.66¼*e*	0.79¾*e*	0/14/0	0/14/0	900*a*	900*a*	0.7763–1.2938	0.7763–1.2938
Carpenters	7*a*	7*a*	0.66¼*e*	0.79¾*e*	1/2/0	1/2/0	800*a*	800*a*	0.7763–1.2938	0.7763–1.2938
Structural Ironworkers	5*a*	6*a*	0.66¼*e*	0.79¾*e*	0/14/0	0/14/0	900*a*	900*a*	0.7763–1.2938	0.7763–1.2938
VALUE IN U. S. CURRENCY										
Official exchange rate	$0.209	$0.209	$0.211	$0.211	$0.210	$0.210	$0.0027*B*	$0.0027*B*	$0.500	$0.500
Free market rate	....	....	$0.211	$0.211	$0.200	$0.200	....	....	$0.250	$0.263

•A per long ton (2,240 lbs) •B per metric ton (2,204.6 lbs) •C per cu meter •D per cu ft •E per 100 cu ft •F per Mfbm •G delivered to jobsite •H ex Karachi mill •I ex warehouse •K ex dock •L imported CEMENT: •a per 94 lb sack •b includes 10% sales tax LUMBER •a teak lumber •b per koku (10'x1'x1') •c deodar lumber •d red luan lumber •e Jak wood •f Swedish pine lumber •g local white wood •h hardwood GRAVEL: •a 15-25 mm •b graded first quality •c 1" •d ¼"–¾" •e 25 mm SAND: •a river sand •b washed •c coarse LABOR (Rates include social charges where applicable): •a per 8 hr day •b per 8½ hr day •c per 10 hr day •d includes 4% social charges paid by employer and 4% paid by government •e includes dearness allowance

Reported to ENR in National currency, June 1, 1960. Prices fob city, wages per hr., except as noted

TUNNEL	LOCATION	LENGTH IN FT.	BORE
Bingham Tunnel #5490	Utah	17,951	20′ x 25′
Flaming Gorge Tunnels	Utah	1,100	20′ x 25′
Salt Lake By-pass	Utah	8,000	8′ x 8′
Columbia Tunnel	Utah	8,500	7′ x 14′
79th St. Chicago Tunnel	Illinois	24,400	19′
Washington, D.C. Tunnel	District of Columbia	6,800	17′
Eucumbene-Tumut	Australia	36,916	24′
Diversion Tunnel	Australia	3,538	18′ x 20′
Murrumbidgee-Eucumbene	Australia	53,800	11.3′
Cumbaya Hydro-Electric Project	Ecuador	27,800	12′
Tooma-Tumut	Australia	49,520	12.5′
Hanabanilla Tunnel	Cuba	22,000	14.1′
Glen Canyon—Diversion	Arizona	2,900	46′
Access	Arizona	12,000	23′
Spillway	Arizona	2,200	50′
Cable Control	Arizona	1,300	7′
Fremont Canyon	Wyoming	22,000	19′
Vasquez Tunnel	Colorado	16,000	7′
Quandary Tunnel	Colorado	6,000	6′ x 8′
McCullough Tunnel	Colorado	6,500	6′ x 8′
Rampart Range Tunnel	Colorado	4,200	8′ x 9′
Silver Falls Hydro-Electric Project	Ontario	10,400	17′
SAGE Tunnels	Ontario	7,000	10′ x 10′
Quebec Cartier Railway	Quebec	5,000	18′ x 22′
Montreal Sewer Tunnels	Quebec	15,000	9′
Bridge River Hydro-Electric Project	British Columbia	13,000	18′
Cooper Lake Hydro-Electric Project	Alaska	4,600	12′
Blue Lake Hydro-Electric Project	Alaska	9,000	12′
Vancouver PO Project	British Columbia	2,200	8′
Navajo Dam	New Mexico	3,200	18′6″

On these 81 tunnels . . . the rock

B&O Railway	West Virginia	581	25′
Foothills Parkway Vehicular	North Carolina	840	32′
Smith Dam Diversion	Alabama	1,946	26′
Flannagan Diversion	West Virginia	780	21′
Blue Ridge Vehicular	North Carolina	900	32′
Canyon-Ferry Tunnel	Montana	12,000	7′
Luray Vehicular	Virginia	1,000	32′
Kettle Creek Diversion	Pennsylvania	900	19′
Allegheny Sewer Authority	Pennsylvania	5,500 52,000	8′ 8′ to 14′

Total length of tunnels: 1,112,735 FEET

Period covered: Tunnels completed or in progress during the past five years ONLY.

TUNNEL	LOCATION	LENGTH IN FT.	BORE
Noonsack Tunnel	Washington	8,800	7′ x 8′
Avamate Water Tunnel	Ohio	3,000	14′
West Delaware Aqueduct	New York	227,040	14′
Newtown Creek Tunnel	New York	8,045	11′6″
Worcester Diversion Tunnel	Massachusetts	4,800	19′
Western Pacific Tunnels #4 & 5	California	12,800	22′ x 28′
Clear Creek Tunnel	California	57,030	17′6″
Lafayette Tunnel	California	15,840	9′6″
Cherry Valley Power Tunnel	California	29,400	12′6″
Eleanor-Cherry Tunnel	California	6,400	11′
Mammoth Pool Tunnel	California	42,240	21′
Haas Tunnel	California	32,800	13′
Jaybird Tunnel	California	23,300	15′
Camino Tunnel	California	27,220	13½′
Western Pacific Railway #2 & 3	California	5,600	22′ x 28′
Mammoth Pool Diversion Tunnel	California	1,300	28′
Wishon Diversion Tunnel	California	1,400	15′
Poe Tunnel	California	36,960	19′ x 27′
Trinity Dam Diversion Tunnel	California	2,800	34′
Western Pacific Railway Tunnel	California	3,000	22′ x 28′
Caribou Power Tunnel	California	9,240	12′
Butt Valley Power Tunnel	California	10,560	13′
Dez Dam—Diversion Tunnel	Iran	2,160	50′
Access Tunnel	Iran	10,820	21′ x 18′
Glendale Tunnel	California	18,000	17′
Green Springs Tunnel	Washington	2,100	6′
Cascade Tunnel	Washington	4,800	6′
Pacific Power & Light—Diversion Tunnel	Washington	3,000	32′
Power Tunnel	Washington	1,575	25′
Penstock Tunnels	Washington	1,950	13′

drills are all Gardner-Denver

Faraday Tunnel	Washington	2,463	23′
Pelton Dam Tunnel	Washington	600	20′
Coregan Dam—Diversion	Washington	1,800	18′
Outlet & Penstock	Washington	2,070	15′
Hills Creek Dam Tunnels	Washington	1,600	18′ x 10′
Main Relief Sewer Philadelphia	Pennsylvania	4,200	16′
Bull Run Dam	Oregon	1,200 1,000	9′ 18′
Chicago Water Tunnel	Illinois	2,250 1,400	16′ stub 20′ stub
Costile Falls Tunnel	Washington	900	12′

EQUIPMENT TODAY FOR THE CHALLENGE OF TOMORROW

GARDNER-DENVER

Gardner-Denver Company, Quincy, Illinois
In Canada: Gardner-Denver Company (Canada), Ltd., 14 Curity Avenue, Toronto 16, Ontario

CIRCLE 75 ON READER SERVICE CARD

CHRYSLER ENGINES

keep on working after other engines have quit!

Take the toughest industrial applications you can find. Applications that demand all-out power—day after day after day. That's where you'll find Chrysler power preferred.

Irrigation is a good example. Irrigation engines work at full throttle, full load—24 hours a day for months at a time. It doesn't take long to separate the workhorses from the ponies.

Check the record and you'll find that Chrysler outsells all other irrigation engines in its power range. Why? Because Chrysler engines keep on working after the others have quit.

What's your application? Chances are there's a rugged Chrysler engine in the 170 to 413 cu. inch range that's just right for your job. Ask us.

PROOF: Jarvis R. Zeeck farms 1,000 acres in West Texas with eight irrigation wells. He says, "The other engines I tried had a bad habit of breaking down when I needed water the most. But my Chryslers set up and run all season without trouble. They just don't wear under the strain like other engines. Last year we irrigated before planting in April and May, then ran the engines continuously—24 hours a day, 7 days a week—from June 15th 'til October 1st. We didn't lose a single day—or even an hour—because of engine trouble."

CHRYSLER

MARINE AND INDUSTRIAL ENGINE DIVISION
CHRYSLER CORPORATION • DETROIT 31, MICHIGAN

Construction Materials Prices, Wages 'Round the World—Continued

	Pacific Area . . .						**Canada . . .**			
	Melbourne (Australia)		**Anchorage (Alaska)**		**Honolulu (Hawaii)**		**Montreal (Canada)**		**Toronto (Canada)**	
	1959	**1960**	**1959**	**1960**	**1959**	**1960**	**1959**	**1960**	**1959**	**1960**
Currency Unit:	Australian Pound		U. S. Dollar		U. S. Dollar		Canadian Dollar		Canadian Dollar	
MATERIALS:										
Structural Steel Shapes	55(68–80*D*)*A*	59(66–78*D*)*A*	$11.55*Ga*	$10.25*Ga*	$10.65*GE*	$10.80*GE*	$8.63–8.50*Gb*	$8.63–8.50*Gb*	$9.20*Gc*	$9.20*Gc*
Reinforcing Steel Bars	57(70–80*D*)*A*	61(68–80*D*)*A*	10.50*Ga*	8.85*Ga*	8.75*GE*	8.75*GE*	7.00–7.50*Gb*	7.00–7.50*Gb*	7.85*G*	7.85*G*
Portland Cement	11/0/0*A*	11/2/0–12/18/0*A*	8.15*a*	7.95*a*	5.28*a*	5.28*a*	3.11*a*	3.11*a*	3.84*a*	3.84*a*
Lumber: 1st Class Pine 2"x4"	15/6/0–17/10/0*B*	16/6/6–17/18/0*B*	110.00*bc*	73.00*bc*	205.00*ba*	205.00*ba*	.....	.....	.....	.....
2nd Class Pine 2"x4"	.....	.....	110.00*bc*	73.00*bc*	.....	.....	.....	.....	.....	.....
Other	7/10/0–9/15/0*Be*	7/7/6–11/5/6*Be*	130.00*bcd*	73.00*bcd*	.....	.....	84.00*bd*	84.00*bd*	98.00*bd*	88.00*bd*
Gravel	1/5/3*Cc*	1/15/6*Cc*	.....	2.50*Cb*	3.00*Fa*	3.00*Fa*	2.15*Fdef*	2.15*Fde*	2.40*Fd*	2.40*Fd*
Sand	1/18/0*Cb*	1/18/0*Cb*	.....	7.00*C*	4.50*Fa*	4.25*Fa*	2.40*F*	2.40*F*	2.05*F*	2.05*F*
LABOR:										
Common Labor:										
Heavy Construction	20/5/3–24/3/3*a*	21/1/0–24/7/6*a*	3.91	4.38	1.95	2.10	1.59	1.79	1.87	2.08
Building	20/5/3–24/3/3*a*	21/1/0–24/7/6*a*	3.91	4.38	2.15	2.30	1.59	1.79	1.87	2.08
Skilled Labor:										
Bricklayers	26/16/1*a*	29/14/11*a*	5.19	5.82	3.20	3.45	2.40	2.61	3.12	3.28
Carpenters	26/0/4*a*	28/16/9*a*	4.35	4.88	2.85	3.10	2.20	2.40	2.91	3.02
Structural Ironworkers	14/18/0–22/7/9*a*	15/12/3–24/16/8*a*	4.66	5.21	2.90	3.00	2.30	2.61	2.96	3.17
VALUE IN U. S. CURRENCY:										
Official exchange rate	$2.249	$2.249	$1.00	$1.00	$1.00	$1.00	.....	.....	.....	.....
Free market rate	.....	.....	.....	.....	.....	.....	$1.041	$1.015	$1.041	$1.015

•A per long ton (2,240 lbs) •B per 100 F bm •C per cubic yard •D imported •E warehouse base price •F per short ton •G per Cwt •H fob Seattle dock STRUCTURAL STEEL SHAPES: •a $40 per Cwt delivered Anchorage •b Canadian and American steel •c average Canadian and American steel REINFORCING STEEL BARS: •a $35 per Cwt delivered Anchorage •b Federal tax exempt, add Provincial and Municipal tax and 10¢ per Cwt delivery charge. CEMENT: •a per bbl LUMBER: •a 75%–80% construction grade, 25%–20% standard grade •b per Mfbm •c $205.00 per Mfbm delivered Anchorage •d spruce lumber •e Australian hardwood GRAVEL: •a #3 crushed rock •b ½" •c ¼" topping •d ¾" •e truckloads delivered •f add 6% Provincial and Municipal tax SAND: •a manufactured •b coarse LABOR: (rates include any social charges or fringe benefits) •a per 40 hour week.

Wages are higher this year in Australia, Alaska and Hawaii. Lumber and domestic steel prices are up in Australia. But steel imports cost less. Hawaii's material prices are generally steady. But Alaskan contractors can buy key materials more cheaply.

Canadian costs are higher this year, reflecting wage increases. Compared with last September, ENR's Montreal Construction Cost Index is up 5%, The Building Cost Index 2% higher. Toronto's Construction Cost Index is 4% higher, but lumber price cuts outweighed skilled wage boosts, pulling the Building Cost Index down 1%.

Canadian Building Cost Indexes—1949=100

Central Mortgage & Housing Corp.						ENR—Montreal Cost Indexes		
	Resid.	Other Bldg.		Resid.	Other Bldg.	Sept.	Constr. Cost	Bldg. Cost
1921	57.1	....	**1948**	95.4	95.8	**1948**	101	100
1926	50.7	....	**1949**	100.0	100.0	**1949**	99	100
1929	54.4	....	**1950**	106.0	105.1	**1950**	107	110
1932	45.3	....	**1951**	123.1	118.8	**1951**	121	122
1939	48.4	58.2	**1952**	126.6	125.4	**1952**	128	125
1940	51.5	60.3	**1953**	128.9	128.9	**1953**	137	136
1941	56.4	64.2	**1954**	129.0	128.6	**1954**	127	124
1942	60.0	67.5	**1955**	132.7	131.5	**1955**	133	131
1943	64.1	69.9	**1956**	137.5	136.5	**1956**	140	139
1944	66.6	70.7	**1957**	141.3	141.5	**1957**	146	143
1945	67.3	71.3	**1958**	144.7	145.1	**1958**	150	142
1946	71.7	76.1	**1959**	150.0	149.8	**1959**	155	145
1947	80.9	84.3	**1960**	.....	.....	**1960**	162	148

Weighted indexes of wholesale prices and wage rates. Residential: materials weighted 62.5 and wage rates 37.5. Other building: Materials weighted 65 and wage rates 35. Intangibles, productivity, etc., not included.

Canadian Building Trades Wage Rates July 1, 1960

Dominion Department of Labour and Canadian Construction Association

	BRICKLAYERS				CARPENTERS				ELECTRICIANS				PAINTERS			
City	**1939J**	**1949**	**1959**	**1960**	**1939J**	**1949**	**1959**	**1960**	**1939J**	**1949**	**1959**	**1960**	**1939J**	**1949**	**1959**	**1960**
Halifax a	$1.00	$1.44	$2.21	$2.29	$0.70	$1.23	$1.95	$2.02	$0.85	$1.33	$2.06	$2.26	$0.60	$1.07	$1.70	$1.76
Saint John	0.90	1.45	2.05	2.25	0.50–0.60	1.10	1.75	1.87	0.50–0.65	1.10	2.00	2.00	0.50–0.55	1.00	1.65	1.65
Quebec	0.75–0.85	1.30	2.08	2.13	0.55–0.60	1.10	1.88	1.93	0.55–0.65	1.10	1.95	2.00	0.50–0.55	1.05	1.78	1.83
Montreal	0.80–0.90	1.40–1.75	2.30	2.55	0.70	1.25	2.20	2.35	0.75	1.35	2.35	2.45	0.66	1.15	2.15	2.25
Ottawa	....	1.65	2.40	2.60	....	1.30	2.25	2.35	....	1.50	2.54*f*	2.59*f*	....	1.00	1.75	1.75*i*
Toronto	1.00	1.80	3.00	3.15	0.90	1.60	2.80	2.90	1.00	1.75	3.30	3.52*h*	0.75	1.35	2.41	2.51
Hamilton	0.90	1.70	2.80	2.95	0.75	1.50	2.50	2.85	0.75	1.55	3.15	3.20*i*	0.65	1.20	2.15	2.30
Windsor	1.15	1.75	2.78	2.88	0.95	1.60	2.60	2.70	1.15	1.75	2.90*c*	3.00*c*	0.60–0.65	1.25–1.35	2.03	2.13
Winnipeg	1.10	1.60	2.50*c*	2.60*c*	0.85	1.40	2.40	2.50	0.85	1.40	2.65	2.75	0.70	1.20	2.10	2.20
Regina	....	1.70	2.50	2.56	....	1.45	2.19	2.25	....	1.50	2.40*d*	2.46*d*	....	1.20	1.94	2.05
Edmonton	1.10	1.80	2.70	2.80	0.90	1.47½	2.45	2.55	0.85	1.60	2.75	2.85	0.80	1.25	2.00	2.00
Vancouver	1.10	1.80	2.87	2.99	0.75–0.90	1.60	2.92	2.92	0.75–1.00	1.70	3.19*a*	3.22*b*	0.63–0.80	1.40	2.70	2.84

	PLASTERERS				PLUMBERS				SHEETMETAL WORKERS				LABORERS			
City	**1939J**	**1949**	**1959**	**1960**	**1939J**	**1949**	**1959**	**1960**	**1939J**	**1949**	**1959**	**1960**	**1939J**	**1949**	**1959**	**1960**
Halifax a	$0.80	$1.35	$2.25	$2.25*j*	$0.85	$1.30	$2.11	$2.21	$0.70	$1.13	$1.84	$1.91	0.30–0.40	$0.81	$1.41	$1.45
Saint John	0.90	1.45	2.05	2.10	0.60–0.70	1.25	1.80	2.00	0.50–0.65	1.20	1.55	1.55	0.30–0.40	0.65	1.10	1.10
Quebec	0.75	1.30	2.08	2.13	0.55–0.65	1.10	1.95	2.00	0.55–0.65	1.10	1.88	1.93	0.40	0.75	1.48	1.53
Montreal	0.80	1.40–1.50	2.50	2.65	0.75	1.55	2.47	2.62	0.65–0.75	1.25	2.25	2.35	0.40	0.80	1.60	1.75
Ottawa	....	1.50	2.25	2.25	....	1.60	2.65	2.80	....	1.47	2.45	2.65	....	0.70	1.30	1.50
Toronto	0.90	1.90	3.00*b*	3.20	1.00	1.75	3.20*e*	3.35*e*	0.93	1.75	3.15*c*	3.25*c*	0.35–0.50	0.95	1.80	2.00
Hamilton	0.90	1.70	2.75*b*	2.90*b*	0.85	1.60	2.90	3.10	0.75	1.55	2.70*g*	2.95*g*	0.35–0.45	1.85	1.70	1.85
Windsor	0.90	1.65	2.53	2.88	1.00	1.75	3.00	3.10	0.70–0.85	1.60	2.90	3.00	0.55	1.10	1.91	2.06
Winnipeg	1.10	1.60	2.60	2.70	0.95	1.55	2.70	2.80	0.70	1.10	2.35	2.40	0.40–0.45	0.75–0.85	....	1.65
Regina	....	1.65	2.40	2.40	....	1.55	2.40	2.50	....	1.35	2.22	2.34	....	0.75	1.51	1.56
Edmonton	1.05	1.85	2.60	2.70	1.05	1.60	2.70	2.75	0.90	1.55	2.70	2.80	0.40–0.50	0.95	1.70	1.80
Vancouver	1.00	1.75	2.85*c*	2.95	1.00	1.70	3.02*a*	3.14*a*	1.00	1.70	2.87	2.92	0.45–0.50	1.15	2.07*a*	2.19*a*

•a Plus 7¢ p.hr. Welfare •b Plus 8¢ p.hr. Welfare •c Plus 10¢ p.hr. Welfare •d Plus 3% Pension Plan •e Includes 6¢ p.hr. Welfare •f Includes 7¢ p.hr. Welfare •g Includes 10¢ p.hr. Welfare •h Includes 12¢ p.hr. Welfare •i Conciliation •j Strike •J July

Materials Prices

Monthly Market Quotations by ENR Field Reporters

LUMBER, TIMBER, PLYWOOD PER M FT.B.M., CARLOAD LOTS F.O.B.

SOUTHERN PINE AND DOUGLAS FIR

All Southern Pine is No. 2 common or better and for No. 1 N. C. Box. (Prices in Bold Face)

All Fir boards, dimensions, planks No. 2, Fir small timbers and timbers are No. 1. Lengths up to 20 ft. (Prices in italics)

	1x6 s4s	1x8 s4s	2x4 s4s	2x6 s4s	2x8 s4s	2x10 s4s	3x12 Rgh	6x12 Rgh	12x12 Rgh	LONG LEAF Y. P. Merchantable grade up to 20 ft. 2x12 Rgh	LONG LEAF Y. P. 12x12 Rgh	FIR PLYWOOD 5/8" Interior plyscored. C-D gr.	FIR PLYWOOD 3/4" Plyform grade*
Atlanta n†	**$ 90.00**	**$ 90.00**	**$ 82.00**	**$ 90.00**	**$ 90.00**	**$ 95.00**	**$125.00**	......	......	**$135.00**	**$155.00**	$125.00	$270.00
Baltimore *b*	**96.00**	**96.00**	**102.50**	**100.00**	**106.00**	**106.00**	**125.00**	......	......	**175.00**	**190.00**	175.00	275.00
	118.00g	*122.00g*	*125.00g*	*126.00g*	*126.00g*	*126.00g*	*150.00g*	*$180.00*	*$170.00*				
Birmingham n†r	**85.00**	**87.00**	**84.00**	**86.00**	**91.00**	**97.00**	**116.00**	......	......	**120.00**	**173.00**	120.30	204.50
	80.00	*80.00*	*83.00*	*81.00*	*81.00*	*98.00*	*88.00*	*85.00*	*93.00*	......	......		
Boston ns	**104.00f**	**104.00f**	**104.00f**	**104.00**	**104.00f**	**122.00a**	......	......	......	......	......	160.00c	290.00c
	108.00	*108.00*	*114.00*	*114.00*	*114.00*	*126.00*	*152.00*	*154.00*	*170.00*				
Chicago **	**117.00**	**120.00**	**114.00**	**123.00**	**136.00**	**137.00**	**132.00**	......	......	**160.00**	**160.00**	147.00	239.00
	123.00	*123.00*	*136.00*	*134.00*	*134.00*	*135.00*	*143.00*	*143.00*	*143.00*				
Cincinnati n*	**102.50**	**103.75**	**96.50**	**98.00**	**104.75**	**112.75**	**121.00**	......	......	**138.00**	**125.00**	92.00f	170.00f
	105.50	*109.00*	*106.00*	*109.75*	*111.50*	*116.50*	*142.00*	*142.00*	*142.50*	......	......		
Cleveland o**	**98.00**	**100.00**	**100.00**	**98.00**	**102.00**	**108.00**	......	......	......	......	......	118.00a	200.00
	......	......	*115.00*	*110.00*	*112.00*	*116.00*	*140.00*	*140.00*	*140.00*				
Dallas ‡	**95.00k**	**99.00k**	**103.00k**	**103.00k**	**103.00k**	**106.00k**	**135.00**	......	......	**138.00**	**160.00**	112.50ac	200.00ac
Denver n*	*Not in stock*		*118.00*	*118.00*	*118.00*	*120.00*	*177.00*	*197.00*	*197.00*	......	......	146.50	233.00
Detroit ‡	**140.00**	**142.50**	**142.00**	**138.00**	**145.50**	**145.00**	......	......	......	**153.50**	......	150.00gc	225.00gc
	132.25	*132.25*	*143.25*	*141.50*	*150.00*	*155.50*	*194.00*	*211.00*	*211.00*	......	......		
Kansas City tn	**120.00**	**120.00**	**120.00**	**125.00**	**128.00**	**150.00**	......	......	......	......	......	135.00	215.00
	120.00	*120.00*	*120.00*	*125.00*	*128.00*	*132.00*	*165.00*	*225.00*	*225.00*	......	......		
Los Angeles xnu	*98.00*	*98.00*	*98.00*	*98.00*	*98.00*	*98.00*	*134.00*	*143.00*	*143.00*	......	......	120.00	210.00
Minneapolis ov	*130.00*	*140.00*	*140.00*	*140.00*	*140.00*	*140.00*	*185.00*	*185.00*	*185.00*	......	......	195.00	305.00
Montreal *bp	**84.00a**	**90.00a**	**84.00a**	**84.00a**	**99.00a**	**125.00a**	......	......	......	**120.00**	**120.00**	119.25	225.95
	160.00	*160.00*	*160.00*	*160.00*	*160.00*	*160.00*	*170.00*	*170.00*	*170.00*				
New Orleans †n	**89.00**	**89.00**	**91.00**	**95.00**	**95.00**	**98.00**	**126.00**	......	......	**160.00**	**155.00**	117.19	200.71
	103.50	*103.50*	*102.50*	*105.50*	*105.50*	*106.00*	*122.00*	*115.50*	*115.50*	......	......		
New York	**115.00**	**118.00**	**120.00**	**126.00**	**126.00**	**129.00**	**250.00**	......	......	**250.00z**	**250.00z**	118.70a	199.60a
	......	......	*120.00*	*120.00*	*120.00*	*125.00*	*169.00*	*174.00*	*175.00*	......	......		
Philadelphia nl	**110.00**	**112.00**	**112.00**	**110.00**	**112.00**	**110.00**	**125.00**	......	......	......	......	138.00h	220.00h
	......	......	*125.00*	*125.00*	*125.00*	*125.00*	*145.00*	*145.00*	......				
Pittsburgh st	**135.00**	**135.00**	**135.00**	**135.00**	**140.00**	**140.00**	**165.00**	......	......	**145.00**	**185.00**	225.00	295.00
	135.00	*115.00*	*145.00m*	*150.00*	*150.00*	*150.00*	*225.00*	*225.00*	*225.00*	......	......		
St. Louis ‡ln	**115.00**	**117.00**	**125.00d**	**125.00d**	**125.00e**	**124.00e**	......	......	......	......	......	162.30achj	244.00ach
	......	......	*134.00*	*134.00e*	*134.00e*	*134.00e*	*189.00e*	*189.00e*	*189.00*	......	......		
San Francisco nz	*71.00*	*71.00*	*82.00*	*82.00*	*82.00*	*82.00*	*93.00*	*115.00*	*116.00*	......	......	92.00h	165-168
Seattle n†	*60.00*	*64.00*	*69.00*	*69.00*	*69.00*	*72.00*	*85.50*	*87.50*	*87.50*	......	......	105.00aeg	190.00aeg
Toronto *	**82.00a**	**84.00a**	**84.00a**	**81.00a**	**83.50**	**83.50a**	**95.00a**	......	......	**89.00a**	......	216.00	261.00
	89.00	*92.00*	*100.00*	*100.00*	*103.00*	*104.00*	*125.00*	......	......	......	......		

† F.o.b. mill. * F.o.b. city, CL, out of yard. ** F.o.b. city, CL, direct mill shipment. ‡ Deliv. to contr. CL.

LUMBER: Bold Face Type, Southern Pine. Italics Douglas Fir. •a Spruce. •b Federal tax exempt, add 6% mun. & prov. tax. •c 5M lots. •d 8, 10, & 12 ft. lengths. •e 8 to 16 ft. lengths. •f Hemlock •g No. 1 common. •j 8 ft. lengths. •k No. 3 common. •l Add 2% sales tax. •n Less 2% disc. 10 days. •o Less 2% disc. 10th. •p Less 1% disc. 10 days. •q fir: $80.25 in truck lots, fob job or CL, f.o.b. city. •r For f.o.b. city price add $8 for pine, $38 for fir eff. 1 1 58. •s asd trucklots. •t trucklots del.

•u Retail LCL yard. •v Retail LCL, del. •w add 6% mun. & Prov. tax. •x add 4% sales tax. •z Hondouras Pine.

* **PLYWOOD** (Plyform, oiled and edge sealed): Douglas fir, 4′ x 8′ panels, 5-ply sanded 2 sides, carload lots, delivered per 1000 sq. ft. surface. Seattle base price, Interior, moisture resistant, 5/8″, $146.00; 3/4″, $166.00 Exterior, waterproof, 5/8″, $150.00; 3/4″, $170.00. •a Delivered. •c Truck lots. •d A-C exterior. •e LCL. •f less 1%, 5 days. •g less 2% for cash. •h less 2% disc, 10 days. •j add 2% sales tax.

GLASS, EXPLOSIVES, CHEMICALS, PILES, TIES

	WINDOW GLASS Discounts from jobbers list, Feb. 1, 1950a Single or Double Strength A quality	WINDOW GLASS B quality	EXPLOSIVES Per lb. 40% Ammonia Gelatin in 50 lb. cases delivered in 500 lb. lots
Atlanta	78%	80%g	$0.2595
Baltimore	74%d	74%d	.2795
Birmingham	82%f	82%f	.2595
Boston	72+10%p	72+10%p	.2795
Chicago	72%	72%	.2795
Cincinnati	74%	74%	.2595
Cleveland	74-2-10%	74-2-10%	.2595
Dallas	76%	76%	.2870
Denver	73.5%	73.5%	.2795
Detroit	72-10-10%	72-10-10%	.2795
Kansas City	76-10-10%	76-10-10%	.2795
Los Angeles	$12.88/17.32h	$10.45/14.13h	.2795
Minneapolis	71-10%	71-10%	.2795
Montreal	40-10-5%b	40-10-5%b	23.20h
New Orleans	76%g	76%g	.2795
New York	79%i	79%	.5130g
Philadelphia	78%	80%	.2795
Pittsburgh	72%	72%	.2595
St. Louis	72-10-10%mo	72-10-10%mo	.2795
San Francisco	60%	73%	.2795
Seattle	$8.85/11.55hiq	$6.41/8.67hjp	.2795
Toronto	$6.49/9.57h	$5.90/8.70h	

Price of 60% Ammonia Gelatin is $0.15 per lb. higher than 40% in U. S.; $1.75 per 100 lbs. higher in Canada.

Glass: •a Jobbers' list price per box, 14 x 20, ss, $42.75 for A quality, $37.50 for B quality; 14 x 20, ds, $60.00 for A quality, $52.75 for B quality. •b sales tax extra. •c 77% for single strength. •d From 6 15 52 list. •e 77% for double strength. •f Single strength; double strength, 83%. •g From 8 1 58 list. •h ss/ds, 40-in. •i 20 boxes min. •j CL quantity. •k eff. 12 58. •l eff. 10/15/58. •m less 2% disc, 10 days. •n less 1% disc, 10 days. •o add 2% sales tax. •p less 1% for cash. •q less 2% for cash

Explosives: Cartridges of 1¼″ diameter or over, in standard lengths. •g deliveries in certain areas must be by truck or by truck and boat, requiring extra charge. •h F.o.b. Beloeil (near Montreal), per 100 lb., lots under 2000#, wood cases, forcite, 40%. Forcite 60%, $24.30 In fiber cases: forcite 40%, $24.05; forcite 60%, $25.80.

40% Ammonia Gelatin price ranges in other than urban areas, per lb:
(except Seismograph Grades)

	C/L 300,000 lb. lots	10,000 lb. lots	2,000 lb. lots	200 lb. lots
Group 1*	$0.2095	$0.2195	$0.2545	$0.2695
Group 2†	.2170	.2270	.2620	.2770

* All areas except those in Group 2 and N.J. cities of Bayone, Hoboken, Jersey City, No. Bergen, Union City and Weehawken † Florida counties of Manatee, Hardee, Highlands, Okeechobee, St. Lucieand south thereof; Idaho; Maine; Montana; New Mexico counties of Catron, Socorro, Lincoln, De Baca, Roosevelt and south thereof; Texas counties of Bailey, Lamb, Hale, Floyd, Motley, Cottle, Hardeman, Foard, Knox, Haskell, Jones, Taylor, Coleman, McCulloch, San Saba, Burnet, Williamson, Milan, Robertson, Leon, Houston, Angelina, Nacogdoches, Shelby and south thereof.

PILES

Prices per linear foot, fir and pine, rough peeled, f.o.b. cars, New York. Fir based on Wash. and Ore. points to New York shipping area; pine under fifty feet based on freight from mid-South, over fifty feet, on freight from deep South.

Dimensions	Points	Length	By Rail Pine*§ R	By Rail Fir R
12″ at butt	6-in.	30 to 39-ft.	$0.42a	....
12″—2-ft. from butt	6-in.	40 to 44-ft.	.91	....
12″—2-ft. from butt	6-in.	45 to 49-ft.	.97	....
12″—2-ft. from butt	6-in.	50 to 54-ft.	1.01	....
12″—2-ft. from butt	6-in.	55 to 59-ft.	1.07	....
14″—2-ft. from butt	6-in.	60 to 64-ft.	1.14	....
14″—2-ft. from butt	6-in.	65 to 69-ft.	1.21	....
14″—2-ft. from butt	6-in.	70 to 74-ft.	1.34	1.40
14″—2-ft. from butt	6-in.	75 to 79-ft.	1.41	1.40
14″—2-ft. from butt	5-in.	80 to 84-ft.	1.54	1.45
14″—2-ft. from butt	5-in.	85 to 89-ft.	1.67	1.54

* Pine piling over 90 feet available only in limited quantities. § ASTM Class B
• a, trucked in from N. J.

RAILWAY TIES

Prices f.o.b. per tie box carload lots:		6″ x 8″ x 8′ Untr.	6″ x 8″ x 8′ Tr.	7″ x 8″ x 8′6″ Untr.	7″ x 8″ x 8′6″ Tr.
Birmingham*	Hardwood, Grade 3	$1.70	$2.55	Gr. 5 $2.25	$3.33
	Grade 2	1.50	2.35	" 4 2.10	3.18
	Grade 1	1.15	2.00	" 3a 1.70	2.78
Chicago	Red Oak	2.85-3.00	4.00a-4.10	3.90	4.75-5.00
New York	Mixed Hardwood	3.45	5.10	4.30	6.50
	Mixed Oak	3.55	5.20	4.40	6.60
Philadelphia	Mixed Oak	3.70i	3.87	...	4.57
St. Louis	Mixed Oak	2.65	3.75a	3.10h	4.20ah
San Francisco	Douglas Fir	1.95ef	3.15ef	2.25ef	3.40ca

Tr.—Treated; Untr.—Untreated. aCreosoted. c Empty cell. e Green f.o.b. cars. g 7 x 9 x 8′6″ * Add 75¢/tie freight charge to Birmingham. •h 7″ x 9″ x 9½. •i Mixed Hardwood

CHEMICALS

Water, sewage treatment, road work, carlots, f.o.b. works

Chlorine cylinders, liquid, per lb. freight allowed, N.Y. State	$ .11
Calcium chloride, 77-80%, flaked, 100-lb. paper bag, ton	32.00
Silicate of soda, 52 deg., in drums, per 100 lb.	2.65
Soda ash, 58%, in paper bags, per 100 lb. dense	1.90
Sulphate of aluminum, commercial, in 100-lb. bags	2.05
Sulphate of copper in bags, 99% per 100 lb., reg., 25.2% copper content	13.00

See following ENR issues for OTHER PRICES:

- Wage Rates, Building Board, Lath, Insulation; Last, Sep. 1; Next, Sep. 29
- Cement Aggregate; Ready-Mixed Concrete, Asphalt; Last, Sep. 8; Next, Oct. 6.
- Iron & Steel Products, Pipe; Last, Sep. 15; Next, Oct. 13.
- Clay Products, Lime, Plaster, Paint, Roofing; Last, Aug. 25; Next, Sep. 29.

a boy can open or close the new ORISEAL® VALVE!

An easy turning Curb Valve with all the features you've looked for.

Try it . . . Prove to yourself how easy this valve will open and close. The Teflon coated straight plug turns easy even after prolonged idleness.

The Key to the dependable long-life performance of the Oriseal is in its simple, practical design. The entire valve assembly is only six parts . . . the three "O" rings in the sturdy valve body, the Teflon coated straight plug . . . the valve cap.

We are happy to offer the Oriseal as another beneficial product developed for the Water Industry . . . the direct result of over a century of experience and tradition for quality "craftsmanship". See your Mueller representative or write Dept. B, Mueller Co., for your copy of "The Oriseal Valve —Test Results".

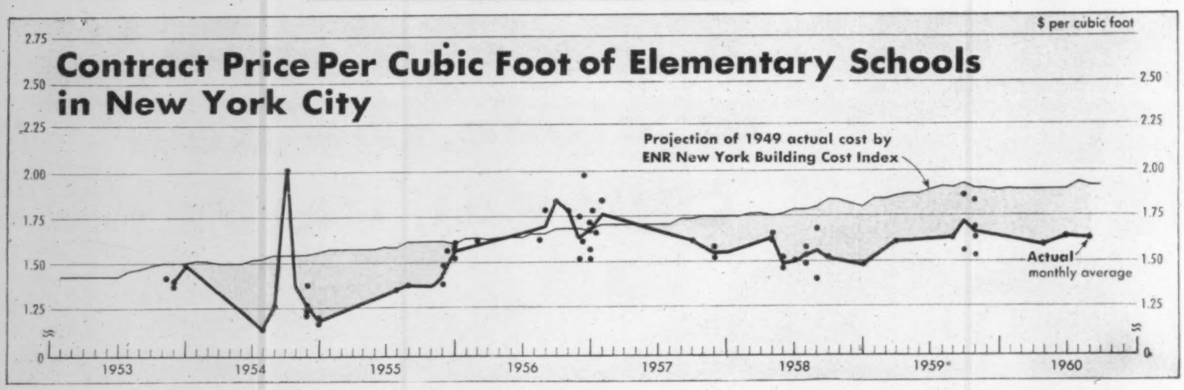
The Oriseal turns easy without grease . . . has no mechanical seating device to wear or cause sticking . . . the seat is protected against damage and erosion.

MUELLER CO. DECATUR, ILL.

Factories at: Decatur, Chattanooga, Los Angeles;
In Canada: Mueller, Limited, Sarnia, Ontario.

CIRCLE 79 ON READER SERVICE CARD

School Contract Costs



Contract Price Per Cubic Foot of Elementary Schools in New York City

School Costs Drop in New York

Contract prices are down this year for new elementary schools in New York City and, according to a small sample, in areas outside the metropolitan area. The downtrend in the city reverses the uptrend noted last year (ENR Mar. 24, 1960, p. 102), but in the rest of the state, the 1960 decline extends the downtrend first apparent in 1957.

The median cost of schools awarded in areas outside New York City fell to $16.10 per sq ft in the second quarter. This compares with $19.65 per sq ft in the first quarter and $17.68 in the second quarter of last year (see chart).

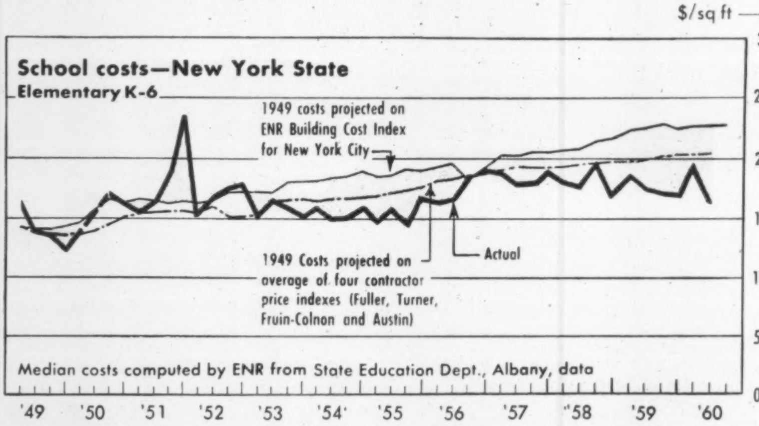
Thus local school districts probably were saved considerable amounts of their school construction appropriations by contractors who bid lower in the face of higher basic costs. Note in the chart above how the gap has widened between median actual contract cost and the projections of actual 1949 costs on the trend in ENR's New York Building Cost Index or on the trend of contractor selling price indexes.

Stiffer competition probably influenced the downtrend in school bids this year. Late in 1959, steel shortages forced a few school districts in New York to postpone bid calls until early in '60. Thus contractors probably had less school construction underway as the 1960 bid calls came up, and they may have trimmed bids in an effort to get new work signed up for this year.

Contract prices on the schools outside New York City ranged from $15.35 per sq ft to a high of $17.00 per sq ft for schools with two large units, such as auditorium, gymnasium, multi-purpose of other group activity room. The one school reported with a single large unit cost $18.60 per sq ft, according to the analysis by the Division of School Buildings and Grounds, State Education Department. The division's cost figures include built-in features but no movable furniture or equipment; they exclude major site work and all land costs.

In New York City, contract prices of five grade schools let in the first eight months of '60 ranged from a low of $1.586 per cu ft bid in April for P. S. 243 (Brooklyn) to $1.649 bid in June for P. S. 232 (Queens). The latter was one of three schools awarded on the basis of combination lump sum bids for all three. The other two projects cost $1.635 per sq ft, according to figures of the Bureau of Construction, Board of Education. The contract prices of the three schools bid in a lump sum actually worked out higher than the other two schools let individually. The bid in August for P. S. 84 (Manhattan) was $1.628 per cu ft.

These cost figures for New York City schools are not adjusted for abnormal site costs.



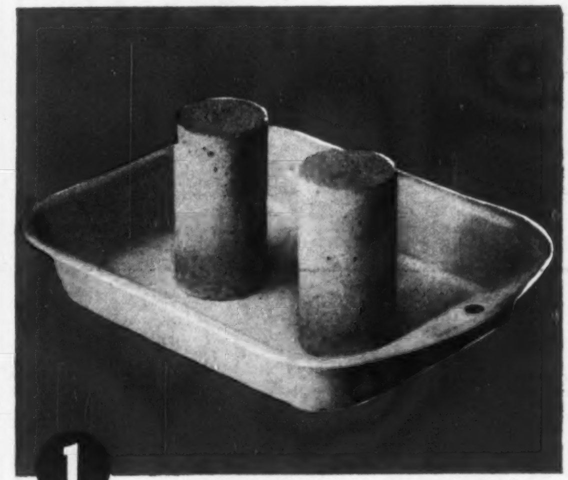
School costs—New York State

Median costs computed by ENR from State Education Dept., Albany, data

School Costs Per Square Foot in New York State

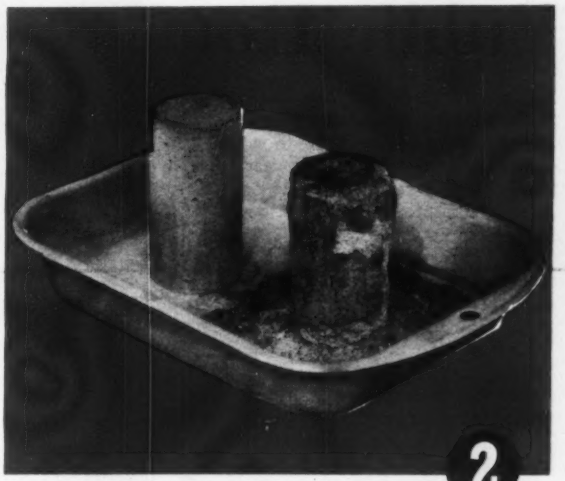
State Education Department, Division of School Buildings and Grounds

	No. of Schools K-6 Total	Elementary, K-6 — Dollars per sq ft for schools with: One Large Unit Min	One Large Unit Med	One Large Unit Max	Two Large Units Min	Two Large Units Med	Two Large Units Max	No. of Schools 7-12 Total	Secondary, 7-12 Dollars per sq ft Min	Med	Max
1949	29	$10.40	$14.00	$19.20	$12.00	$14.60	$18.70	4	$13.20	$13.55	$16.20
1955	52	11.75	16.40	23.60	11.90	15.70	20.25	13	12.55	17.10	18.50
1956	53	12.90	17.85	23.80	13.25	17.65	21.10	7	15.40	18.15	20.90
1957	50	14.65	19.28	25.20	12.90	18.10	21.75	10	16.40	18.61	20.60
1958	32	13.85	18.95	22.30	13.50	17.30	20.30	8	15.90	16.55	19.70
1959	..	14.45	17.55	21.80	14.80	17.25	21.70	..	.....	.....	.....
'59, Q1	1	.....	.....	.....	.....	18.50	.....	..	.....	.....	.....
Q2	6	16.20	17.68	19.00	15.20	17.00	18.80	..	.....	.....	.....
Q3	8	14.70	21.00	21.80	14.80	15.30	17.30	..	.....	17.50	.....
Q4	5	14.45	17.00	17.00	18.60	19.95	20.30	..	.....	.....	.....
'60, Q1	4	20.90	21.10	21.30	15.25	16.83	18.40	..	.....	.....	.....
Q2	6	.....	18.60	.....	15.35	15.50	17.00	..	.....	19.70	.....



1

Make a cylinder of Brixment mortar and a cylinder of 50-50 cement-and-lime mortar. Cure for 30 days. Then put ¼″ of water into a tray and place tray in a freezer.



2

Keep water in tray, and alternately freeze and thaw. After a number of cycles, you will be convinced that Brixment mortar is far more durable than cement-and-lime mortar.

BRIXMENT mortar is far more DURABLE!

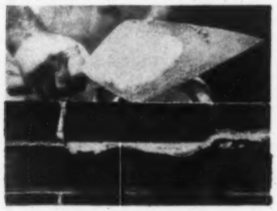
Good mortar must be durable—must be able to withstand the alternate freezing and thawing to which it is subjected many times each winter.

Brixment mortar is durable. Its greater durability is due partly to the strength and soundness of Brixment mortar—partly to the fact that an air-entraining and water-repelling agent is completely intermixed into Brixment during manufacture. This helps prevent the mortar from becoming saturated, therefore protects it from the destructive action of freezing and thawing.

But greater durability is only *one* of the characteristics in mortar necessary to produce top-quality masonry at lowest cost. Several others are listed below—and *no other mortar combines ALL these characteristics to such a high degree as Brixment mortar.* It is this combination of advantages that makes Brixment superior to any mixture of portland cement and lime—and which also accounts for the fact that Brixment has been the leading masonry cement for over 40 years.

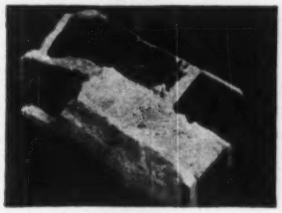
Louisville Cement Company, Louisville 2, Ky.

BRIXMENT MORTAR ALSO COMBINES THESE 8 OTHER ESSENTIAL CHARACTERISTICS

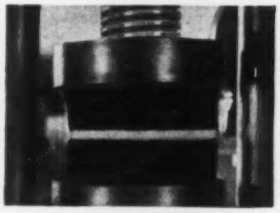


PLASTICITY

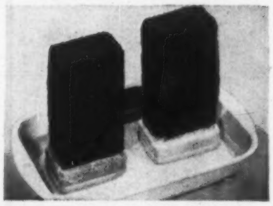
WATER RETENTION



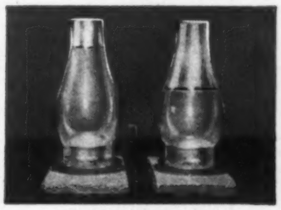
BOND



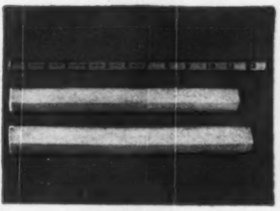
STRENGTH



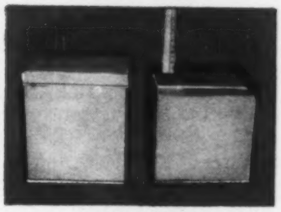
LOW EFFLORESCENCE



IMPERMEABILITY



SOUNDNESS



YIELD

CIRCLE 81 ON READER SERVICE CARD

Public Housing Bids Up in NYC

Contract prices of new state-aided public housing projects let by the New York Municipal Housing Authority rose in the early months of this year. The two projects were awarded at contract costs ranging from $1.25 per cu ft to $1.334 per cu ft. These costs compare with the range of $1.145 to $1.307 for two projects let last year—and the range of $1.126 to $1.307 for all projects let by the Housing Authority in 1959.

Contract prices of state-aided public housing projects throughout the state from 1942 through May '60 are in the table, compiled by the New York State Division of Housing. Included are many New York public housing projects (through 1959) that ENR has previously reported in more detailed breakdowns of contract costs. However, this table is limited to state-aided projects. In the case of New York City, this means that many public housing projects are not included—for example, four of the city's six 1959 projects (ENR Mar. 24, p. 104).

Projects listed in the table that are outside New York City are mostly one- or two-story row houses with crawl spaces instead of basements. These show indications of costing more in 1960 than in 1959, but differences in location may account for part of the difference in costs. Two projects in Plattsburgh let in January ranged from $0.97 per cu ft to $1.28 per cu ft. Last year, two contracts for this type ranged from $0.92 to $1.00. Since 1941, contract prices for this type of public housing job appear to have more than doubled—costs in 1942 ranged from $0.37 to $0.46 per cu ft. Most of this rise came in the Forties.

Auburn's Melone Village, a one-to-two story row-type project with basement was awarded in 1958 at 14% higher cost, $0.86 per cu ft, than the original project let in 1950 at $0.75.

Contract prices of fireproof public housing projects over six stories outside New York City increased from $1.16 in 1956 to $1.37 in 1959, while contract costs in New York City fluctuated between $1.09 and $1.43 during this period. New York projects, however, ranged up to 20 stories during this period, while the projects in the six-story-up class outside New York City ranged up to eight stories.

In Buffalo, three projects in the six- to seven-story class were let in 1955 and 1956. Kensington Heights, let in '55, went for a contract price of $1.02 per cu ft. Prices were up the next year, however, when Talbert Mall and Ellicott Mall were awarded at contract prices of $1.16 per cu ft and $1.21, respectively.

Public Housing Costs

New York State Division of Housing—Source

			Number of . . .		Rental	Density,		Construction Cost Per . . .	
Project Name	Location	Stories	Buildings	Rental Rooms	Rms/Apt (Aver)	Persons Per Acre	Bid date	Rental Room	Cubic Foot
Nor-ton Courts	No. Tonawanda	1, 2	43	924	4.6	50	6/16/42	$1,089	$0.37
Colin Kelly Hts	Tonawanda	1, 2	34	695	4.6	42	6/16/42	1,079	0.42
Steinmetz Homes	Schenectady	2	51	1,161	4.5	58	11/19/42	1,082	0.42
Lincoln Hts	Schenectady	2	8	342	4.5	88	11/19/42	1,124	0.44
Packard Courts	Niagara Falls	1, 2	33	779	4.7	32	12/18/42	1,167	0.46
Center Courts	Niagara Falls	1, 2	20	623	4.6	41	12/18/42	1,177	0.46
Hathorn Courts	Elmira	2	45	1,153	4.6	33	2/8/43	1,161	0.45
Washington Courts	Utica	2, 3	10	678.5	4.6	84	3/30/44	1,275	0.50
Abraham Lincoln	New York (Man.)	6, 13	15	6,075	4.8	471	9/25/46	1,776	0.969
Brownsville	New York (Bklyn)	3, 6	27	6,279	4.7	311	9/25/46	1,487	0.835
J. W. Johnson	New York (Man)	6, 10, 14	10	6,139	4.7	487	9/25/46	1,591	0.843
Amsterdam	New York (Man)	6, 13	13	5,128	4.7	472	12/13/46	1,670	0.913
Marcy	New York (Bklyn)	6	27	8,275.5	4.8	280	2/19/47	1,783	0.939
Cottage Pl. Gardens	Yonkers	3, 4	13	1,122	4.5	189	4/9/47	1,826	0.91
Lillian Wald	New York (Man)	10–14	16	8,625.5	4.6	497	9/24/47	1,830	0.892
Hartley Houses	New Rochelle	6	5	1,110	4.6	166	10/15/47	2,147	1.13
Gøwanus	New York (Bklyn)	4–14	16	5,413.5	4.8	414	12/9/47	1,765	0.955
Humphrey Gardens	Utica	2	3	499	4.6	45	4/28/48	1,954	0.79
Astoria I	New York (Queens)	6, 7	22	2,340	4.9	176	5/3/48	1,869	0.951
" II	" " "			3,267	5.2		3/14/50	1,428	0.749
Salt City Homes	Syracuse	3, 4	4	1,007.5	4.7	105	6/29/48	2,098	0.94
Pathfinder Courts	Fulton	2	3	632	4.6	60	9/16/48	2,003	0.92
Gov. Smith I	New York (Man)	15–17	12	5,286	4.6	386	9/24/48	1,951	1.114
" " II	" " "			3,608.5	4.5		8/28/50	1,949	1.053
Albany	New York (Bklyn)	14	6	3,798.5	4.6	391	10/8/48	2,094	1.020
MacLeay Apts	New Rochelle	6	3	840	4.7	72	10/21/48	2,325	1.02
Bronx River	New York (Bronx)	14	9	5,968	4.8	413	12/7/48	1,883	0.966
Lester W. Patterson	New York (Bronx)	6, 13	15	8,519.5	4.8	471	12/14/48	1,776	0.969
Yates Village	Schenectady	2	8	1,435	4.6	63	2/15/49	1,927	0.79
Winbrook Apts. I	White Plains	9	5	2,095	4.7	201	2/16/49	2,057	0.96
" " II	" "						11/1/50		0.92
B. F. Levister Towers	Mt. Vernon	10	5	2,273.5	4.6	258	3/10/49	1,949	0.96
Griswold Hts	Troy	2	8	1,639	4.7	46	3/22/49	1,947	0.75
Saratoga Terrace	Binghamton	2	5	763	4.6	71	5/5/49	1,984	0.71
Gillmore Village	Utica	2	6	926	4.6	52	6/15/49	1,741	0.76
Graceland Terrace	Port Chester	4	1	360	4.5	88	6/17/49	1,883	0.84
Farragut I	New York (Bklyn)	13, 14	10	4,599	4.7	374	7/11/49	1,436	0.812
" II	" " "			1,979	4.7		5/2/50	1,510	0.852
Parkside Gardens	Hempstead	3	1	373.5	4.6	93	8/17/49	1,910	0.79
Melrose I	New York (Bronx)	14	8	2,455	4.6	372	9/21/49	1,447	0.814
" II	" " "	14		2,409.5	4.9		4/25/50	1,387	0.764
Eastwood Homes	Syracuse	2	4	928	4.6	64	4/17/50	1,922	0.70
Wm. W. Smith Apts.	Poughkeepsie	3	3	873	4.7	88	6/16/50	2,266	0.92
Stephen Foster I	New York (Man)	13, 14	10	3,185.5	4.8	430	8/15/50	1,624	0.866
" " II	" " "			3,179	4.5		5/27/52	1,728	0.952
Cloverdale Apts.	Watertown	2	4	444	4.6	52	8/22/50	2,494	1.22
Spinney Hill	No. Hempstead	2	11	472	4.6	59	8/30/50	2,508	0.91
Harbor Homes	No. Hempstead	2	6	304	4.6	50	8/30/50	2,461	0.93
Dante Place	Buffalo	12	7	2,948	4.8	423	9/15/50	2,102	0.93
Liberty Gardens	Rome	2	8	842	4.7	69	9/28/50	2,238	0.66
Flushing I & II	New York (Queens)			1,829.5	4.6		10/17/50	2,064	1.029
Belmont Courts	Ogdensburg	2	18	607	4.8	46	10/30/50	2,470	1.20
Melone Village	Auburn	2	18	555	4.7	51	11/9/50	2,537	0.75
Dunbar Hts	Peekskill	2	13	448	4.7	48	2/9/51	2,571	1.03
Hanover Houses	Rochester	7	7	1,848	4.7	237	2/21/51	2,575	1.15
Redfern I	New York (Queens)	6, 7	7	1,596	4.4		6/5/51	2,217	1.083
" II	" " "			526	5.5		3/18/52	1,987	1.097
Ferry Grider	Buffalo	2	17	991	4.7	77	7/10/51	2,996	1.00
John Jones Court	Elmira	3	1	402	4.8	118	7/17/51	2,960	1.09
Colonial Gardens	Kingston	2	4	459	4.7	54	10/27/51	2,336	0.97
Soundview	New York (Bronx)	7	13	5,826.5	4.6	210	8/22/52	1,717	0.956
A. L. Bourne Apts	Newburgh	7	1	384	4.5	283	8/22/52	3,042	1.25
Forest I	New York (Bronx)	9, 14	15	3,016.5	4.6	286	10/21/52	1,785	0.981
" II	" " "			3,043.5	4.4		10/26/54	1,941	0.989
J. T. Kenney Apts	Newburgh	2	6	540	4.5	83	10/21/52	2,201	0.86
Cypress Hills	New York (Bklyn)	7	15	6,576	4.6	210	2/3/53	1,738	0.927
Carver I	New York (Man)	6, 15	13	2,600	4.6	361	2/25/53	1,838	0.999
" II	" " "			3,203	4.7		8/23/55	1,972	1.149
Howard	New York (Bklyn)	7, 13	10	3,689.5	4.5	220	5/11/54	2,061	1.039
Hamilton Homes	Oswego	2	17	527	4.6	55	8/26/54	2,657	0.73
Sumner I	New York (Bklyn)	7, 12	13	2,644.5	4.5	208	9/14/54	1,907	1.033
" II	" " "			2,346	4.6		3/20/56	2,108	1.2365
Marlboro	New York (Bklyn)	7, 16	28	8,059	4.7	222	3/1/55	1,962	1.042
Hillview Homes	Salamanca	2	12	454.5	4.6	32	4/27/55	2,608	0.98
Kensington Hts	Buffalo	6	6	1,835.5	4.9	128	5/18/55	2,272	1.02
Daniel Daly	Glen Cove	3	2	461.5	4.7	104	9/22/55	2,837	1.13
David Moore Hts	Middletown	2	8	473.5	4.7	52	12/9/55	2,939	0.97
Mill Brook I	New York (Bronx)	16	9	3,112.5	4.5	456	1/11/56	2,089	1.139
" " II	" " "	16		2,576	4.6		10/2/56	2,234	1.2417
Talbert Mall	Buffalo	6, 7	12	3,804.5	5.0	222	1/31/56	2,259	1.16
Frederick Douglass	New York (Man)	5–20	17	9,219	4.5	403	3/23/56	2,209	1.0883
Ellicott Mall	Buffalo	7	8	2,929.6	5.0	226	8/28/56	2,335	1.21
Laurel Homes	No. Hempstead	2	9	341	4.8	71	10/4/56	2,883	0.96
Castle Hill	New York (Bronx)	12, 20	14	9,761	4.8	229	5/7/57	2,553	1.120
Bushwick	New York (Bklyn)	13, 20	8	5,653	4.6	332	2/4/58	2,473	1.1515
Manhattanville	New York (Man)	20	6	5,986	4.7	463	4/29/58	2,661	1.229
Melone Village Ext	Auburn	1, 2	14	347	5.0	70	9/11/58	2,933	0.86
Edgemere	New York (Queens)	7, 9	24	6,661.5	4.8	198	9/30/58	2,264	1.155
L. I. Goldbas	Utica	1, 2	6	395.5	5.3	68	11/13/58	2,224	0.98
F. X. Matt Apts	Utica	1, 2	9	473.5	4.8	90	11/13/58	2,161	1.06
Woodrow Wilson	New York (Man)	20	3	2,225	5.6	804	4/3/59	2,038	1.1449
A. Albright Courts	Tonawanda	2	7	340	5.3	59	8/6/59	2,175	1.00
Stapleton	New York (Rich)	8	6	3,585	4.8	171	8/25/59	2,506	1.3065
Bohlman Towers	Peekskill	8	1	697	5.2	329	9/15/59	2,798	1.37
John J. Chartres	Geneva	2	12	626	5.0	55	10/27/59	2,476	0.92
....	Plattsburgh	2	7	422	5.0	39	1/12/60	......	0.97
Hortense B. Sterns	Plattsburgh	2	3	136	2.8	44	1/12/60	......	1.28
Audubon	New York (Man)	20	1	833	5.0	1,319	3/22/60	......	1.2502
Mill Brook Ext	New York (Bronx)	16	1	611.5	4.9	456	5/10/60	......	1.334

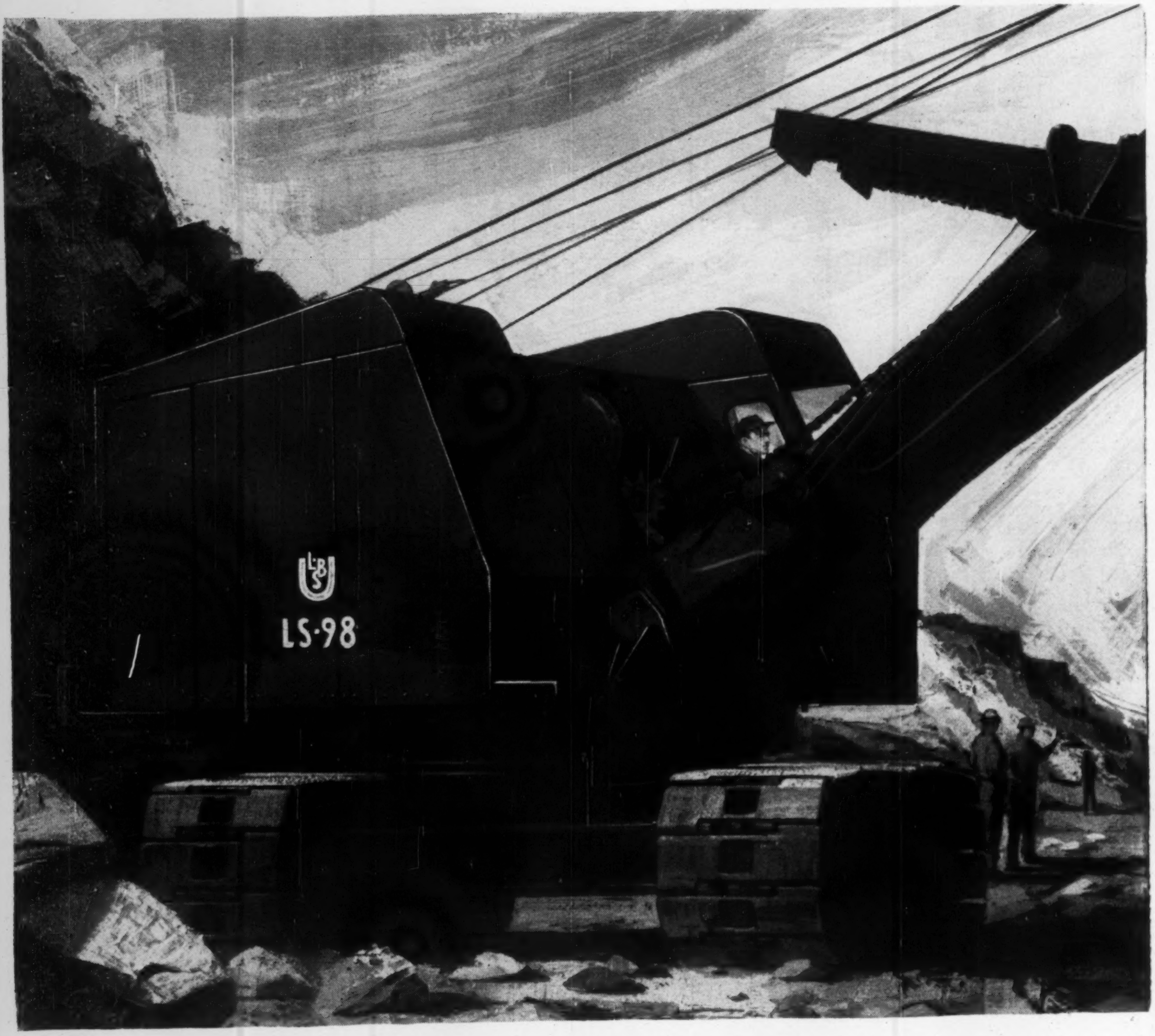
* State-Aided projects only.

INSTANT SPACE

■ Don't expect packaged space to come in a glass jar. But simulated environments are available from Vitro which can duplicate conditions millions of miles away. Using its proprietary high-intensity arc, Vitro is designing a solar radiation simulator for the Department of Defense. USAF scientists will use it to expose coatings slated for space vehicle application. ■ The arc accurately represents the solar spectrum and energy distribution—importantly, from a single source. To date, this is Vitro's proven record of accomplishment: eleven major projects in which the simulation of unusual environment was vital.

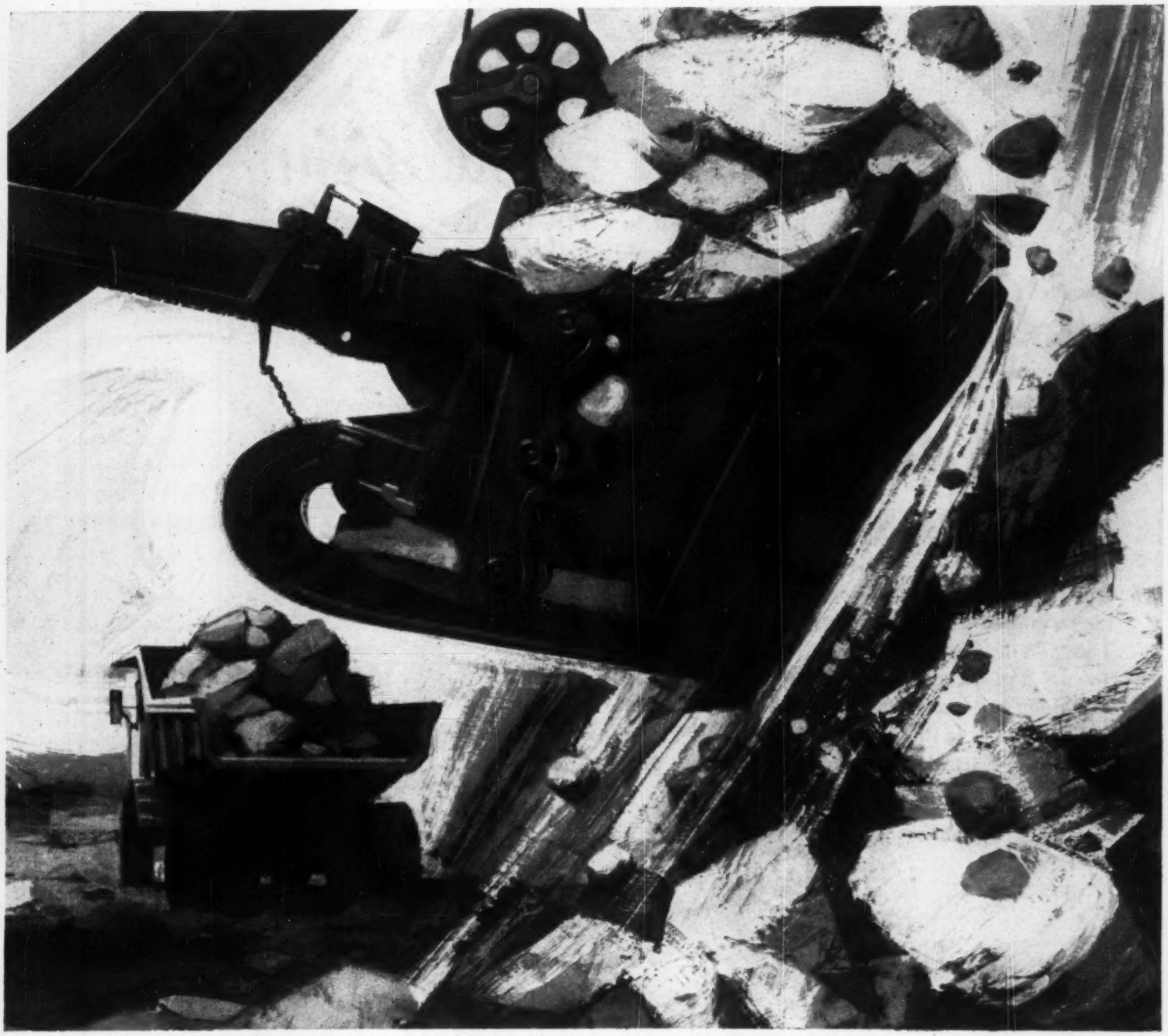
Vitro

VITRO ENGINEERING COMPANY/A Division of Vitro Corporation of America/NEW YORK•WASHINGTON•LOS ANGELES•TORONTO/OVERSEAS: GENEVA•MILAN•BOMBAY



TANK-TOUGH LINK-BELT SPEEDERS...

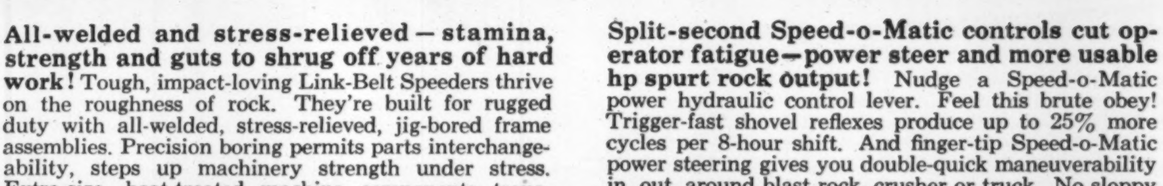
treat rock like dirt !



All-welded and stress-relieved — stamina, strength and guts to shrug off years of hard work! Tough, impact-loving Link-Belt Speeders thrive on the roughness of rock. They're built for rugged duty with all-welded, stress-relieved, jig-bored frame assemblies. Precision boring permits parts interchangeability, steps up machinery strength under stress. Extra-size, heat-treated machine components transmit more of rated hp to swing, hoist, travel, slam the dipper in. All-welded shovel-booms and dipper sticks . . . all-manganese buckets soak up strains without a shudder. Shafts, gears, bearings are precision aligned, stay aligned. No shims needed. Clutches are self-compensating for heat and normal lining wear.

Split-second Speed-o-Matic controls cut operator fatigue—power steer and more usable hp spurt rock output! Nudge a Speed-o-Matic power hydraulic control lever. Feel this brute obey! Trigger-fast shovel reflexes produce up to 25% more cycles per 8-hour shift. And finger-tip Speed-o-Matic power steering gives you double-quick maneuverability in, out, around blast rock, crusher or truck. No sloppy mechanical wear and repair. Payoff: top-profit rock production for *years* . . . at rock-bottom cost. For information on the complete line of shovels and cranes (½- to 3-yd., 8- to 75-ton capacities), see your distributor or write LINK-BELT SPEEDER CORPORATION, Cedar Rapids, Iowa. 101-60-N

LINK-BELT SPEEDER



It's time to compare . . . with Link-Belt Speeder

CIRCLE 85 ON READER SERVICE CARD

Thor

Everything you want in Crawler Rock Drills...

and more!

Thor's all new Crawler, Model TR-5, outperforms wagon drills three to one and every other crawler by quite a margin. One man operation. All-hydraulic controls completely flexible to maneuver mast and boom into any drilling position. Thor TR-5 is equipped with Thor model 140 4½" drifter. Two 8 h.p. rotary air motors propel the compact drilling machine. Ask your Thor "Red Tool" distributor to show you the movie of this remarkable crawler. Thor Power Tool Company, Aurora, Illinois. Branches in all principal cities.

Thor
POWER
TOOLS

3rd Quarterly Cost Roundup

Where the Building Dollar Goes

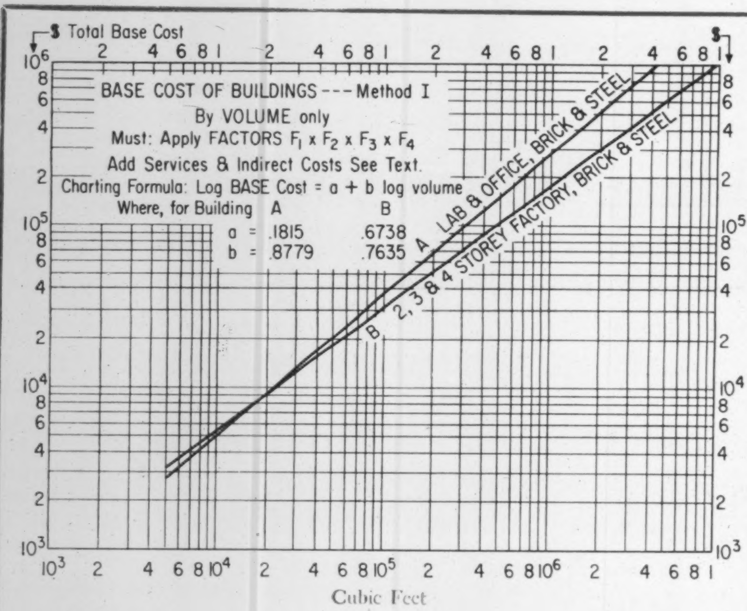
Unit and Ratio Costs Supplied through the Courtesy of Barton-Malow Co., Detroit, Mich.; Underwood-Testman Co., Albuquerque, N. M.; J. Norman Henkel Inc., Baltimore, Md.

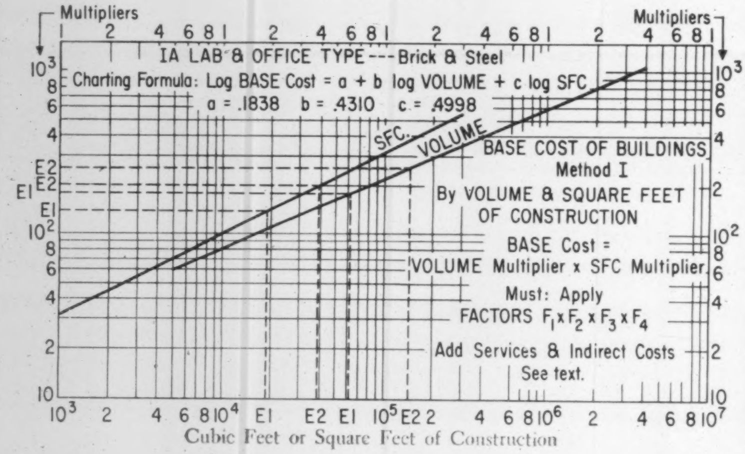
TYPE OF: Building	Research Laboratory	General Office	Office	Hospital	Drug Store & offices
Construction: frame	steel	concrete	steel & lift slab	steel	steel & wood
outside walls	glass	brick	alum. window wall & brick	brick	brick & block
Date construction started	Spring 1958	Dec. 1957	Oct. 1959	May 1959	March 1960
Location	Ann Arbor, Mich	Detroit, Mich	Albuquerque, N.M.	Albuquerque, N.M.	Baltimore, Md.
SIZE OF BLDG:					
Height, stories	3, basement & ph	4, basement & ph	3 & basement	1	2 & basement i
Floor area, sq ft	177,282 sf	50,772 sf	19,614 sf	20,500 sf	7,500 sf
Volume, cu ft	2,445,786 cf	1,422,994 cf	183,063 cf	215,250 cf	210,000 cf
RANGE of Cost of this type Bldg:			Min / Aver / Max	Min / Aver / Max	
$ per sq ft	$37.00	$15.42	$12.00 / 15.00 / 24.00	$16.50 / 20.00 / 30.00	$8.65
$ per cu ft	2.68	0.55	1.00 / 1.50 / 2.75	1.50 / 1.90 / 3.50	0.32
% Air Conditioned	100%	100%	100%	100%	33⅓%
Engineering News-Record Building Cost Index (1913=100) 20-cities average	516	516	555	544	555

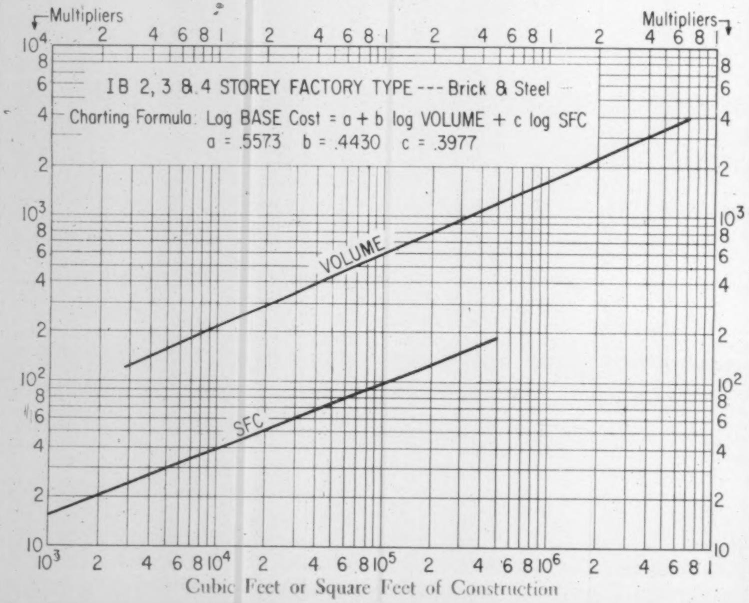
PRINCIPAL ITEMS OF COST	Research Laboratory $	%	General Office $	%	Office $	%	Hospital $	%	Drug Store & offices $	%
Excavation & site improvements	183,527	2.80	38,308	5.00	3,552	1.38	7,682	1.90	7,500	11.60
Foundations	117,988	1.80	29,876	4.00	3,631	1.40	4,220	1.00	2,975 j	4.60
Structural frame	721,038	11.00	171,236	22.00	44,581	17.36	48,598	12.10	7,775	11.90
General conditions	.....		.....	.....	.....	.....	.....	.....	2,500	3.90
Cement finish work	58,994	0.90	12,900	2.00	2,023	0.80	2,151	0.50	975	1.50
Exterior masonry	52,439	0.80	74,286	9.40	13,172	5.10	13,306	3.30	10,250	15.80
Glass wall panels & framing	485,063	7.40	.....	.....	.....	.....	.....		.....	.....
Metal wall panels	.....		.....		.....	.....	1,353	0.30	.....	.....
Interior partitions	301,525	4.60	40,700	5.00	35,622	14.00	42,327	10.60	895	1.40
Toilet partitions	.....	.....	.....	.....	1,225	0.48	.....	.....	.....	.....
Carpentry & millwork	13,110	0.20	42,000	5.30	1,211	0.50	12,434	3.10	6,525	10.10
Sash & glazing	6,555	0.10	117,300	15.00	8,165	3.10	10,252	2.60	2,868 k	4.40
Doors	see hollow metal		see hollow metal		1,598	0.62	incl in millwork		175	0.30
Roofing	58,994	0.90	28,200	3.60	1,527	0.60	7,000	1.70	900	1.40
Insulation	26,220	0.40	incl in roofing		410	0.20	1,351	0.30	475	0.70
Waterproofing & dampproofing	13,110	0.20	1,960	0.20	1,367	0.53	incl in roofing		575	0.90
Metal lath, furring & plastering	196,647	3.00	48,000	6.10	11,400	4.44	40,182	10.00	2,175	3.40
Hollow metal work	45,884	0.70	6,270	0.80	incl in doors		6,081	1.50	300	0.50
Misc. Iron & ornamental metal	262,196	4.00	51,527	6.50	.....	.....	.....	.....	150	0.20
Shelves, lockers & cubicles	.....		.....	.....	.....	.....	4,689	1.20	.....	.....
Tile, terrazzo & marble	58,994	0.90	15,333	1.90	967	0.38	11,211	2.80	.....	.....
Floor covering	45,884	0.70	30,000	3.80	2,190	0.85	4,940	1.20	1,175	1.80
Painting	45,884	0.70	14,709	1.80	2,198	0.86	5,725	1.40	935	1.40
Finish hardware	19,665	0.30	10,500	1.30	1,280	0.50	7,564	1.90	375	0.60
Acoustical ceilings	19,665	0.30	50,000	6.30	4,483	1.75	2,570	0.60	1,440	2.20
Screens	.....	.....	.....	.....	9,975 c	3.80	.....	.....	.....	.....
Plumbing	760,368	11.60	not known		38,782	15.12	106,141	27.50	3,000	4.60
Heating, ventilating & air condition	1,540,402	23.50	not known		in plumbing		in plumbing		4,985	7.60
Electrical work	485,063	7.40	not known		21,334 d	8.31	46,376 f	1.60	4,000	6.20
Special equipment	137,653 a	2.10	.....	.....	12,996 e	5.00	5,630 g	1.40	.....	.....
Laboratory equipment	753,813	11.50	.....	.....	.....	.....	1,633 h	0.40	.....	.....
Elevators	104,878	1.60	not known		13,826	5.40	.....	.....	.....	.....
Cold storage	13,110	0.20	.....	.....	.....	.....	.....	.....	.....	.....
Incinerator	26,220	0.40	.....	.....	.....	.....	.....	.....	.....	.....
Post tensioning	.....	.....	.....	.....	14,400	5.50	.....	.....	.....	.....
Miscellaneous equipment	.....	.....	.....	.....	4,663	2.00	6,738	1.60	1,895 l	3.00
Total Cost	$6,554,899	100%	$783,105	100% b	$256,543	100%	$400,154	100%	$64,819	100%

a Special scientific equipment b 100% of values reported, mechanicals not included c Kool shade screens d Includes intercommunication system e Lifting slabs f Includes intercommunication system and power plant g Hospital equipment h X ray equipment i 2nd floor unfinished j Block 12" k With aluminum work l Rough-in 2nd floor P-H-AC elect

This report is the seventeenth in Engineering News-Record's Building Dollar series. Earlier reports were published in ENR Oct., 1953; Sept. 29, 1955; July 5, 1956; Aug. 2, 1956; Dec. 6. 1956; Oct. 17, 1957; Mar. 20, 1958, Dec. 25, 1958; Mar. 19, 1959; June 18, 1959; Sept. 17, 1959; Dec. 17, 1959; Mar. 24, 1960; June 23, 1960.







Estimating

Quality and Complexity Correction Assessment

Brick & Steel Buildings
A Laboratory & Office Type
B 2-, 3- and 4-story Factory Type

These apply only to buildings, do not include services.

The limits on each range indicate the factor for extreme conditions and the evaluator should judge his expected conditions in the light of these extremes.

Component (Scope)	Conditions			Factor
				A & B
BASIC FACTOR (Complete building)	Normal for building type			1.00
SUBSTRUCTURE (Excavation, backfill & concrete incl ground or basement floor)	12" conc block on conc footings 5' to 6' deep			−.07
	Simple excav, light shallow conc footings			−.07
	Normal excav conditions, continuous conc footing walls 5' to 6' deep			0
	Difficult excav, heavy conc construction, hard strata, complex ground floor			+.12
			A	B
FRAME (Structural framework incl misc steel)	Light steel, low price		−.08	−.10
	Steel for moderate loading, average spans, no travelling crane		0	0
	Heavy steel combined with high price		+.12	+.18
				A & B
EXTERIOR WALLS (All outside walls except foundation walls)	4" brick veneer + dry wall + insulation			−.14
	Cement-asbestos tile insulated sandwich (incl supporting steel girts)			−.13
	8" masonry, small area, simple			−.09
	complex + insulation			−.02
	12" masonry, simple			−.01
	complex, large area, insulation			+.06
WINDOWS & DOORS (Exterior walls only)	Large area, low quality sash			−.03
	Aver. percentage of wall area & quality of sash			0
	Large area, high priced sash			+.06
		No. of Suspended Floors—A & B		
		one	two	three
SUSPENDED FLOORS (Single story A—no suspended floor, use Factor —.01)	Wood floor & joists	−.02	−.04	−.05
	Concrete, Simple		−.01	−.02
	Average	0	0	0
	Complex (or steel grating)	+.02	+.04	+.05
ROOF (Deck, roof covering, insulation & ventilators)	Design plain, min. flashings, no insulation or openings, 20 yr bond, area:		Q type steel A & B	Precast or wood A & B
	relatively large		−.03	−.02
	relatively small		−.02	−.01
	Design average, flashing, openings, regardless of area		−.01	0
	Design complex, insulation, area: relatively large		+.01	+.02
	relatively small		+.03	+.04
			A	B
CEILING (Suspended from or attached to floor or roof above)	Underside of floor, or roof untreated		0	0
	Ceiling, plain simple		+.04	+.03
	suspended		+.07	+.06
				A & B
INTERIOR FINISH (All applied to walls or floors after erection Incl plastering)	Unfinished			−.02
	Painted			0
	High quality finish or covering, acoustic tile ceiling, etc.			+.05
BASEMENT (Measured to underside of ground floor)	No basement			0
	Full basement			−.07
F_4 QUAL & COMPLEX FACTOR	Algebraic sum of selection made from above factors			F

Building Costs Faster (Method I)

The quest for a faster, cheaper, more accurate estimating technique for buildings has brought out two quite different shortcut systems, both tied to square feet of construction. This includes all flat surfaces, not just floors.

Method I is shown here as it was unveiled by C. Arthur Miller for the American Association of Cost Engineers at its Houston meeting in June. Mr. Miller is Supervisor, Cost Studies, Scheduling & Standards, Engineering Department, Canadian Industries Ltd., Montreal.

His system combines volume and over-all square feet of construction (sfc), develops and charts base costs for each class of building, then modifies these by applying a system of correction factors.

Method II, shown in the companion article on page 92 uses selective area takeoff and pricing of square feet of construction (sfc).

Both methods have these advantages:

- They are more accurate than the standard square or cube systems of estimating building costs.
- They are much faster and less costly than full scale quantity takeoff estimating.
- They are usable before the design is completed, when only line diagrams are available to define the dimensions and as soon as specifications are sufficiently developed to define the quality and complexity.
- They are fast, low enough in cost and accurate enough to evaluate cost advantages of alternate proposals before final adoption for full scale design.

As to disadvantages, both methods

How to Estimate Total Cost

Direct Cost . . .
. . . of building = Base Cost × F_1 × F_2 × F_3 × F_4
. . . of services = a percentage of Direct Cost (see table)
Indirect Costs = a percentage of Total Direct Cost (Building + Services)
Total = sum of Direct and Indirect Costs

Where correction factors are:
F_1 type of contract
F_2 current economic conditions
F_3 time and geographic location variables
F_4 quality of materials and complexity of design

How to Assess Correction Factors

F_2 Type of contract: lump sum .... .85 to .90
cost plus .... .95 to 1.05

F_2 Economic conditions: competitive situation, labor productivity and availability, adverse weather conditions, supervision, estimator's experience and judgement .85 to 1.20

F_3 Time & Geography: Values shown here are all tied to E. H. Boeckh index value of 100 (in Canada. For USA, multiply by C.85). Multiply values shown in charts by appropriate Boeckh index and divide by 100 to get value to use for F_3

F_4 Quality and Complexity: Varies with each type of building, see specific examples for each type of building

How to Estimate Indirect Costs
Average—by type of contract:

	% of Direct Costs
lump sum	8-10
cost plus	12-16

(Includes indirect field costs, contractor's overhead and profit. Does not include cost of land or engineering).

Direct Cost of Services Or Mechanicals

Do not include services outside the building—sub-station, sewer and water or other lines or conduits

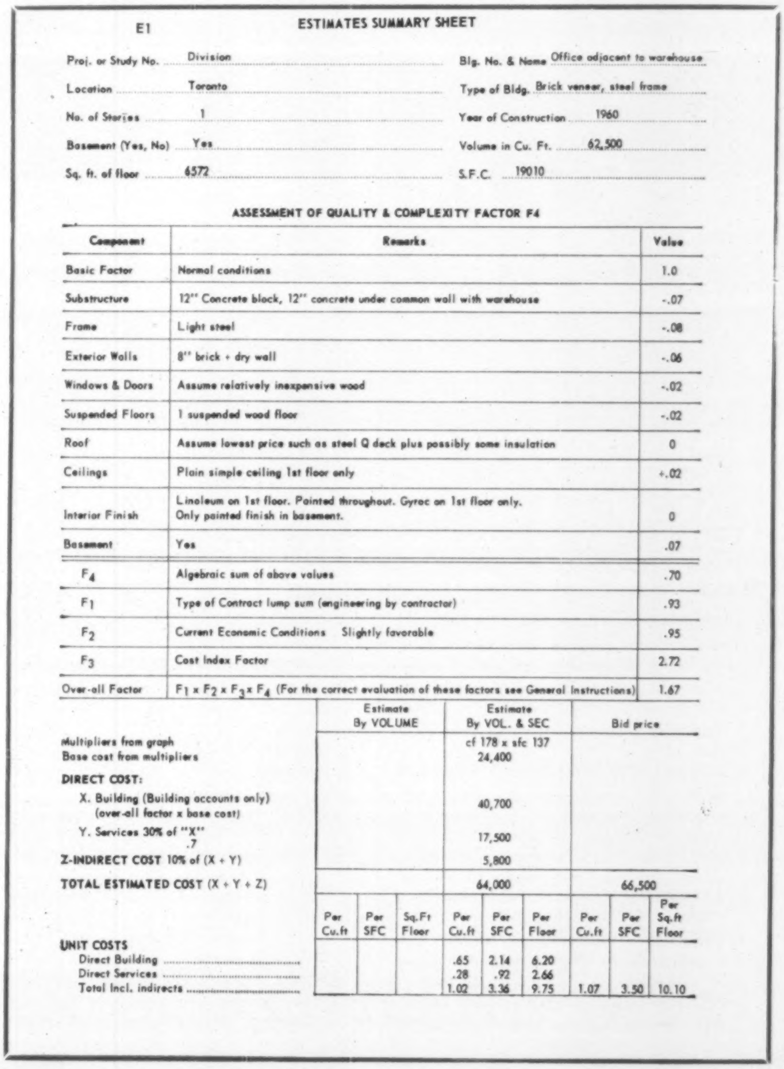
% of Direct "Normal" Building Cost—F_4 = 1.0

	Labs			Offices		
Service	Low %	Normal %	High %	Low %	Normal %	High %
Compressed Air[a]	0	5	6	0	0	3
Electrical:						
a Power	2	4	10	0	3½	9
b Lighting	13	14½	16	6	9½	15
Sprinklers	4	5	9	2½	5	9
Plumbing	7	11	25	6	11½	17
Gas (labs only)	0	2	4	..	..	..
Heating	13	15	25	8	13	25
Ventilation:						
a without air cond.	0	23	35	0	2½	10
b with air cond.	30	40	55	10	20	30
Total	45	80	120	25	45	60

[a] for general service only

	Process Bldgs.[b]			Warehouses		
	Low %	Normal %	High %	Low %	Normal %	High %
Compressed Air[a]	.5	1½	4	0	0	½
Electrical:						
a Power	..	3	..	0	1½	5
b Lighting	5	8½	18	3	5	12
Sprinklers	3	6	10	2½	5	9
Plumbing	3	12	20	4	6	7
Gas (labs only)	..	..	..	..	..	..
Heating	8	16	25	4	7	18
Ventilation:						
a without air cond.	0	8	18	½	1½	4
b with air cond.	25	35	45	..	..	..
Total	20	55	85	15	27	45

[b] process services not included



E1

ESTIMATES SUMMARY SHEET

Proj. or Study No. Division
Location Toronto
No. of Stories 1
Basement (Yes, No) Yes
Sq. ft. of floor 6572
Blg. No. & Name Office adjacent to warehouse
Type of Bldg. Brick veneer, steel frame
Year of Construction 1960
Volume in Cu. Ft. 62,500
S.F.C. 19010

ASSESSMENT OF QUALITY & COMPLEXITY FACTOR F4

Component	Remarks	Value
Basic Factor	Normal conditions	1.0
Substructure	12" Concrete block, 12" concrete under common wall with warehouse	-.07
Frame	Light steel	-.08
Exterior Walls	8" brick + dry wall	-.06
Windows & Doors	Assume relatively inexpensive wood	-.02
Suspended Floors	1 suspended wood floor	-.02
Roof	Assume lowest price such as steel Q deck plus possibly some insulation	0
Ceilings	Plain simple ceiling 1st floor only	+.02
Interior Finish	Linoleum on 1st floor. Painted throughout. Gyroc on 1st floor only. Only painted finish in basement.	0
Basement	Yes	.07
F_4	Algebraic sum of above values	.70
F_1	Type of Contract lump sum (engineering by contractor)	.93
F_2	Current Economic Conditions Slightly favorable	.95
F_3	Cost Index Factor	2.72
Over-all Factor	$F_1 \times F_2 \times F_3 \times F_4$ (For the correct evaluation of these factors see General Instructions)	1.67

	Estimate By VOLUME			Estimate By VOL. & SEC			Bid price		
Multipliers from graph				cf 178 x sfc 137					
Base cost from multipliers				24,400					
DIRECT COST:									
X. Building (Building accounts only) (over-all factor x base cost)				40,700					
Y. Services 30% of "X" .7				17,500					
Z-INDIRECT COST 10% of (X + Y)				5,800					
TOTAL ESTIMATED COST (X + Y + Z)				64,000			66,500		
	Per Cu.ft	Per SFC	Sq.Ft Floor	Per Cu.ft	Per SFC	Per Floor	Per Cu.ft	Per SFC	Per Sq.ft Floor
UNIT COSTS									
Direct Building				.65	2.14	6.20			
Direct Services				.28	.92	2.66			
Total Incl. indirects				1.02	3.36	9.75	1.07	3.50	10.10

need a whole new "library" of cost data:

- Method I requires a base cost graph for each class of building and corresponding correction factor values, based on analysis of a sufficient number of buildings to establish a valid base.
- Method II requires a new composite system of area unit prices.

When both are fully developed, Method I will probably hold the edge on speed, Method II on accuracy.

To get the total cost of the building, Method I uses the sum of direct and indirect costs: direct building cost is the base cost multiplied by four correction factors; the direct services or "mechanicals" cost is a selective percentage of the direct building cost; and the indirect cost is a selective percentage of total direct costs.

The key to success in this system is development of base cost graphs and correction factors plus the estimator's skill and judgment in applying them.

Base Cost graphs, derived from analysis of a substantial number of like buildings, fit these mathematics:

Log cost = a + b log volume + c log sfc, where values of a, b and c vary for each category of buildings.

Correction for quality and complexity varies also by type of building.

Shown here are both base cost graphs and quality and complexity factors for two classes of steel and brick buildings: lab and office type and 2-, 3- and 4-story factory type. In studies to date warehouses have proved the most troublesome, requiring correction factors of greater ranges than for other types of buildings, hence they have not attained comparable accuracies in this system of estimating. In the examples shown, one estimate overshot the contract price by 6½%; the other was under by 4%.

Selective percentages for estimating "services" or "mechanicals" are shown, also correction factors for type of contract, economic conditions, time and geography.

E2

ESTIMATE SUMMARY SHEET

Study No.	Division	Blg. No. & Name	Proposed Winnipeg Office
Location	Winnipeg	Type of Bldg.	Office
No. of Stories	1	Year of Construction	Early Spring of 1960
Basement (Yes, No)	Yes	Volume in Cu. Ft	149,400
Sq. ft. of floor	12,190	S.F.C.	38,130

Based on preliminary drawings

ASSESSMENT OF QUALITY & COMPLEXITY FACTOR F4

Component	Remarks	Value
Basic Factor	Normal conditions	1.0
Substructure	(Excludes piling which is treated as an extra). Fdn. walls reinf. beams spanning the piles. Concrete caps 2'-6" deep x 3' sq. approx. on top of each pile	+.09
Frame	Light steel	-.04
Exterior Doors	Brick veneer, wood stud, insulation & dry wall, elaborate architecture at front entrance	-.12
Windows & Doors	Double, double hung aluminum. Above average area. Thermopane at front entrance.	+.06
Suspended Floors	1 Susp. floor - wood joists and deck.	-.02
Roof	Wood deck, 1" insulation, flooded, plain, average area.	+.02
Ceilings	Susp. ceilings 1st floor and part of basement.	+.05
Interior Finish	Very high quality in entrance and reception room, Venetian blinds, v.a. floor tiles.	+.05
Basement	Yes	-.07
F_4	Algebraic sum of above values	1.02
F_1	Type of Contract — Lump sum	. 9
F_2	Current Economic Conditions — Slightly favorable	.95
F_3	Cost Index Factor	2.58
Over-all Factor	$F_1 \times F_2 \times F_3 \times F_4$ (For the correct evaluation of these factors see General Instructions)	2.25

	Estimate By VOLUME	Estimate By VOL. & SFC	Bid price
Multipliers from graph	- - - - -	cf 257 x sfc 176	
Base cost from graph	52,500	50,200	
DIRECT COST:			
X. Building (Building accounts only) (over-all factor x base cost)	118,000	113,000	
Separate estimate for piling	4,200	4,200	
Y. Services 55% of X (excl. piling)	65,000	62,200	
Z-INDIRECT COST 10% of (X + Y)	18,700	18,000	
TOTAL ESTIMATED COST (X + Y + Z)	205,900	197,400	185,420

UNIT COSTS	Per Cu.ft	Per SFC	Sq.Ft Floor	Per Cu.ft	Per SFC	Per Floor	Per Cu.ft	Per SFC	Per Sq.ft Floor
Direct Building				.79	3.08	9.65			
Direct Services				.42	1.63	5.10			
Total Incl. indirects	1.38	5.40	16.89	1.32	5.20	16.20	1.24	4.87	15.20

Also outlined are the rules for computing volume and area.

At this stage of development the emphasis is on the technique and its potential rather than on the cost data developed to date. Refined base cost data and correction factors will result from further analysis of buildings in the categories already developed. For others, development of base and correction factor data would be needed to make the system operative.

RULES for Computing Volume and Areas

VOLUME: total cubic feet, from underside of floor slab (basement floor slab if existing) to top of roof or to a horizontal plane, level with top of parapet if one exists, and to outside of building walls. Exclude foundation walls below the lowest floor slab.

SQUARE FEET OF CONSTRUCTION (SFC): the sum of roof and floor areas, platforms, mezzanines, wall and partition areas, parapets and footing walls. Exclude roof trusses, interior columns, column piers, column footings, and suspended ceilings.

BASEMENT: any floor below grade, see STORY.

CEILINGS: suspended or directly connected: treat as inherent part of the floor or roof above.

FLOORS: figure as areas enclosed by outside dimensions of building—make no deductions for stairwells or for floor openings of less than 25 sq ft.

PLATFORMS & MEZZANINES: include these. Class those with full headroom above as floors when numbering the storys.

PENTHOUSES: note in description with approximate relative to roof, i.e. "Two storys and penthouse (25%).

ROOFS: figure to outside of outside walls (unless actual roof overhang is known).

STAIRS: Inside, see FLOORS

Outside figure on horizontal projections, and include with floor areas.

Outside stair enclosures figure as above.

STORY: the horizontal division established by any floor at or above grade. (Also see BASEMENT). Note the presence of a basement i.e. 2 stories and basement. Cost a one story building with basement by the "2, 3 & 4 story classification".

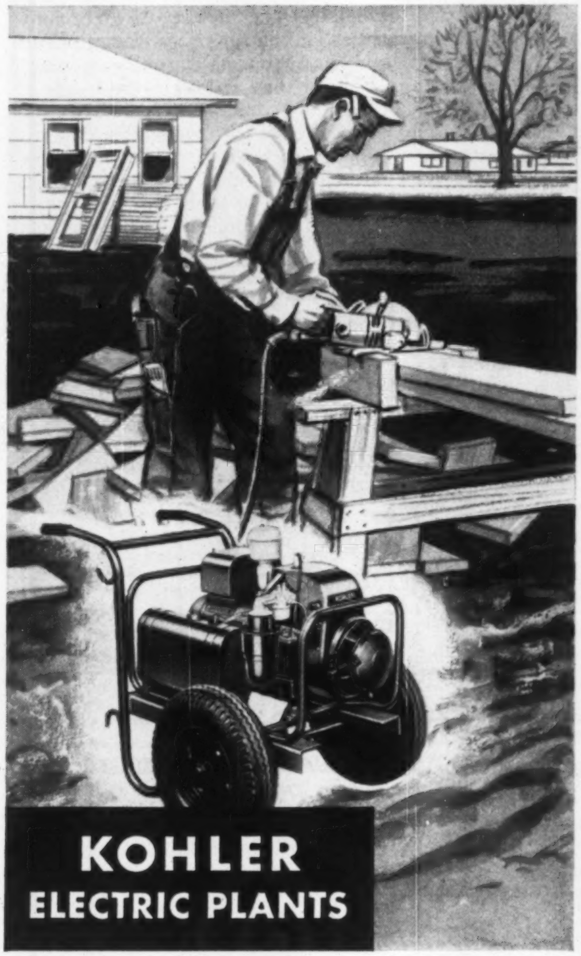
WALLS, Existing: include in determining square feet of construction and cost, then make a suitable deduction.

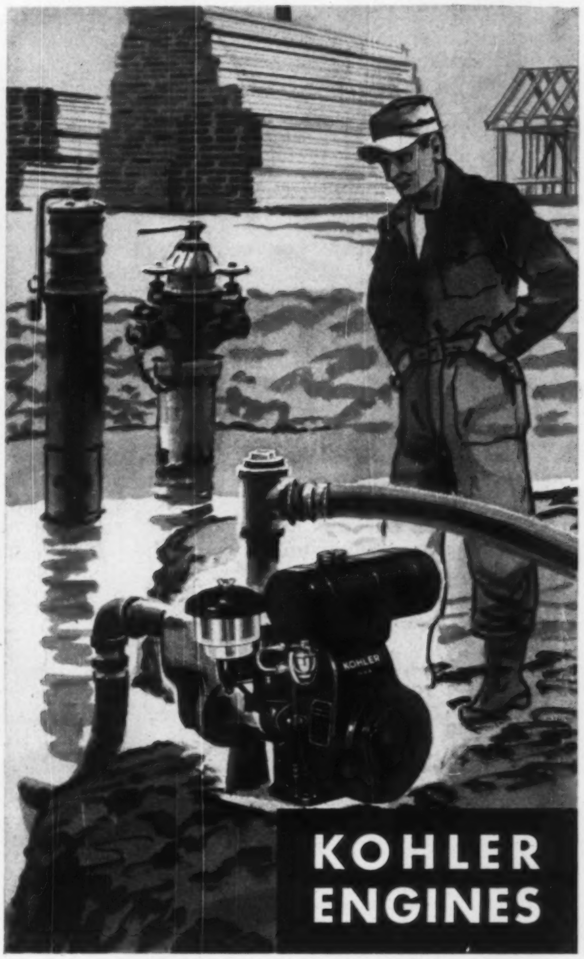
Inside Partitions. (fixed and removable) figure by lengths and heights shown on plans. Use 6 ft height for toilet stalls.

Outside: include parapets and openings for doors and windows. Use outside lengths and heights in figuring these quantities, figure heights from underside of ground floor.

Foundation: figure total depth from underside of ground floor to bottom of spread footing and overall length of outside of wall. Include foundation wall areas within building, but exclude individual column footings.

POWER with a reputation for rugged reliability





Model 2.5M25, 2500 watts. Powered by a Kohler engine. Sizes to 100 KW gasoline or diesel.

4-Cycle • Short stroke • Air-cooled. Model K91. Sizes from 4 to 24 H.P.

Since 1920, Kohler electric plants, powered by Kohler engines, have provided reliable, efficient electric power for sole supply, automatic stand-by and marine needs.

Also powered by Kohler engines are many kinds of equipment, produced by numerous leading companies, for use in construction, agriculture and industry.

With long experience in the production of internal combustion engines and electrical generating sets, Kohler Co. emphasizes ruggedness, conservative rating, ease of maintenance, ease of starting. Sales and service nation-wide. Write for illustrated printed matter.

KOHLER CO. *Established 1873* Kohler, Wis.

KOHLER OF KOHLER

ENAMELED IRON AND VITREOUS CHINA PLUMBING FIXTURES • ALL-BRASS FITTINGS • ELECTRIC PLANTS • AIR-COOLED ENGINES • PRECISION CONTROLS

CIRCLE 91 ON READER SERVICE CARD

Estimating Building Costs Faster

Selective take-off and pricing of square feet of construction are the main features of an estimating system developed by J. A. Condon & Associates, Construction Consultants, Miami, Fla.

This second, direct method of estimating cost from square feet of construction (sfc) came to light in the discussion by the Cost Engineers of Mr. Miller's Method on page 88. Advantages and disadvantages common to both are set forth there.

Here's how W. T. Trotter, P. E., Condon partner explains this estimating system:

Use of the "square foot of construction" in cost engineering is not a new idea. Several cost indices and appraisal guides make extensive use of it. But we have found their use confined by-and-large to that of scope estimation.

We make extensive use of the "square foot of construction" as a tool in the preparation of preliminary cost estimates. However, we take particular issue with the use of an overall sfc total that combines all areas of construction. We find this and the appraisal guide methods to give good average results. However, where a project, which through its shape, type of construction, quality level, etc., varies from average, one is easily misled. It is rather like expecting the daily average stock market price change to be applicable to each stock price from which the average is computed. (Mr. Miller points out that Correction Factor F_4 corrects sub-area by sub-area in Method I.)

We, therefore, list each principal area of construction separately, with the quantity being its flat surface. We price it according to its components. Mechanical and electrical services do not necessarily follow such a category and can be calculated on other bases. We vary our technique with the completeness of the design at the time of the estimate, and the use to which the estimate will be put. It is particularly applicable to existing construction where no plans at all are available.

We find this separation of the various areas to be of particular use when the design has not been crystalized and budget control is essential. We then select for our estimating those types of construction which, in our opinion, best follow the criteria of the design at the most reasonable established costs. When our reports are summarized and have been approved, they provide a useful working tool to the designers. For the owner, they are excellent authentication for mortgage commitments and similar budget control purposes.

This system is fast in the hands of those fully grounded in basic labor and material costs for construction items.

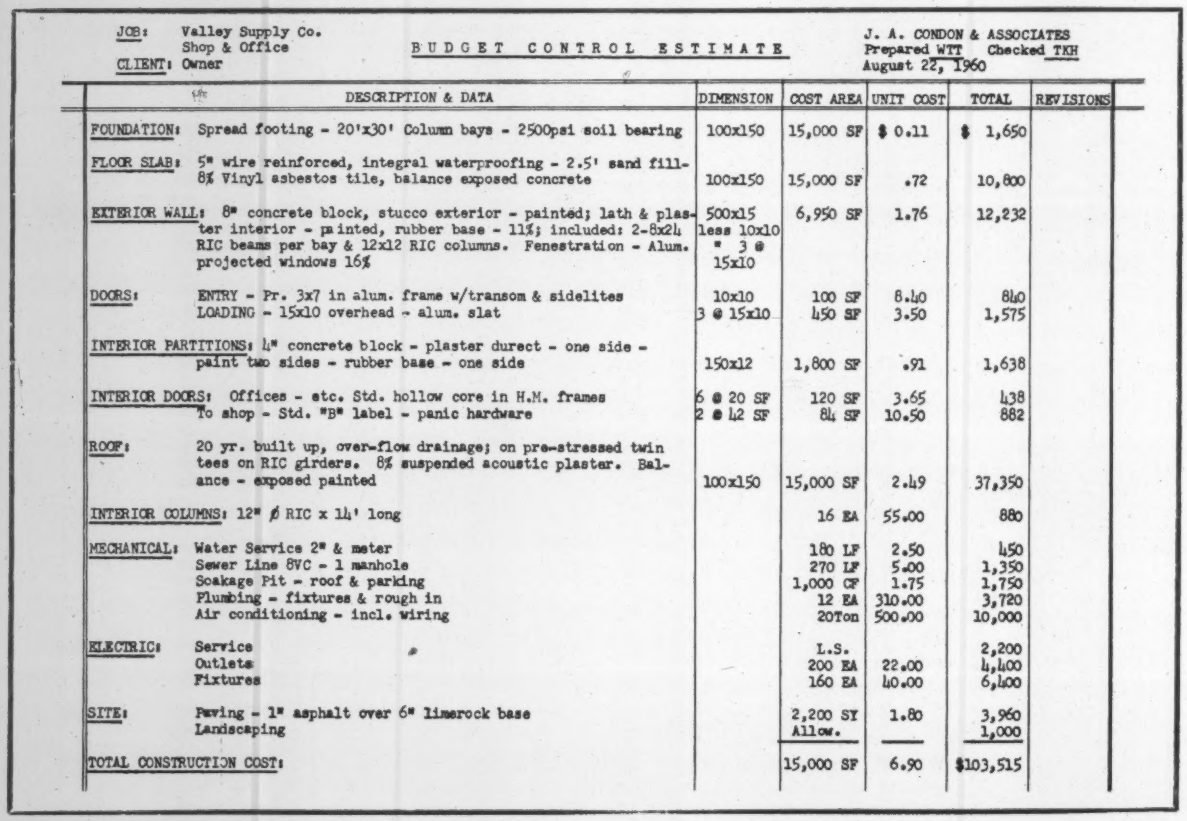
The accompanying rules for computing area in square feet, and examples showing how to apply area unit prices, illustrate the simplicity of this method.

Sample Unit Cost Development

Concrete Floor Slab

1.	100 sf	5 in conc. in place	@ 16.90/cy	$26.10
2.	110 sf	6-6x10-10 mesh in place	@ 4.33/sfc	4.76
3.	100 sf	cement finish	@ .05/sf	5.00
4.	2.5'x100'	sand fill in place	@ 2.10/cy	19.80
		30% compaction		5.94
5.	100 sf	fine grade & set screeds	@ .042/sf	4.20
6.	8 sf	Vinyl asbestos tile	@ .44/sf	3.52
7.	92 sf	floor hardner	@ .026/sf	2.39
		Total for 100 sfc		$71.71
		Unit Cost/sfc		.72

Such data are readily adaptable to varying conditions of slab thickness, reinforcing, fill, surface finish, etc.



JOB: Valley Supply Co.
Shop & Office
CLIENT: Owner

BUDGET CONTROL ESTIMATE

J. A. CONDON & ASSOCIATES
Prepared WTT Checked TKH
August 22, 1960

DESCRIPTION & DATA	DIMENSION	COST AREA	UNIT COST	TOTAL	REVISIONS
FOUNDATION: Spread footing - 20'x30' Column bays - 2500psi soil bearing	100x150	15,000 SF	$ 0.11	$ 1,650	
FLOOR SLAB: 5" wire reinforced, integral waterproofing - 2.5' sand fill- 8% Vinyl asbestos tile, balance exposed concrete	100x150	15,000 SF	.72	10,800	
EXTERIOR WALL: 8" concrete block, stucco exterior - painted; lath & plaster interior - painted, rubber base - 11%; included: 2-8x24 RIC beams per bay & 12x12 RIC columns. Fenestration - Alum. projected windows 16%	500x15 less 10x10 " 3 @ 15x10	6,950 SF	1.76	12,232	
DOORS: ENTRY - Pr. 3x7 in alum. frame w/transom & sidelites	10x10	100 SF	8.40	840	
LOADING - 15x10 overhead - alum. slat	3 @ 15x10	450 SF	3.50	1,575	
INTERIOR PARTITIONS: 4" concrete block - plaster durect - one side - paint two sides - rubber base - one side	150x12	1,800 SF	.91	1,638	
INTERIOR DOORS: Offices - etc. Std. hollow core in H.M. frames	6 @ 20 SF	120 SF	3.65	438	
To shop - Std. "B" label - panic hardware	2 @ 42 SF	84 SF	10.50	882	
ROOF: 20 yr. built up, over-flow drainage; on pre-stressed twin tees on RIC girders. 8% suspended acoustic plaster. Balance - exposed painted	100x150	15,000 SF	2.49	37,350	
INTERIOR COLUMNS: 12" ∅ RIC x 14' long		16 EA	55.00	880	
MECHANICAL: Water Service 2" & meter		180 LF	2.50	450	
Sewer Line 8VC - 1 manhole		270 LF	5.00	1,350	
Soakage Pit - roof & parking		1,000 CF	1.75	1,750	
Plumbing - fixtures & rough in		12 EA	310.00	3,720	
Air conditioning - incl. wiring		20Ton	500.00	10,000	
ELECTRIC: Service		L.S.		2,200	
Outlets		200 EA	22.00	4,400	
Fixtures		160 EA	40.00	6,400	
SITE: Paving - 1" asphalt over 6" limerock base		2,200 SY	1.80	3,960	
Landscaping		Allow.		1,000	
TOTAL CONSTRUCTION COST:		15,000 SF	6.90	$103,515	

(Method II)

Rules for Computing Area

for selective pricing of sq ft of constr.

FOUNDATIONS: analyze requirements and apply a unit cost to the square foot of ground area to be covered by the structure. Allow for expected fill, dewatering, sheet piling or bracing and other foreseeable ground conditions to the extent of knowledge of the site conditions.

EXTERIOR WALLS: include the structural frame, the wall itself and interior and/or exterior finishes. List and price separately large window areas, curtain wall systems and store front construction.

INTERIOR PARTITIONS: separate by basic types: masonry, steel stud, movable, and price each square foot to include the structural elements and the finishes.

FACTORY BUILT PARTITIONS: furnished complete with doors, include the prorata costs of doors in the partition cost.

JOB-BUILT PARTITIONS: list doors separately, normally.

WALL AREAS: analyze prevailing trade practice as to estimation of openings. Usually, both plasterers and painters make very little deduction for openings.

The going rule of thumb is: no deduction if the opening is less than 100 sq ft, a 50% deduction for openings over 100 sq ft. The trades feel their labor cost to be higher in getting around the opening than if the opening were not there. This is particularly true where the opening leaves soffits, sills, reveals and/or jambs to be plastered.

Deduct masonry costs at openings, however, or a sizeable overpricing will occur.

FLOOR SYSTEMS: price to include the structure, the most prevalent surface finishes and the most prevalent ceiling finishes. Give particular attention to the design criteria with regards to fireproofing, heat transmission or loss, sound absorption. If not part of the preliminary criteria, make allowances where applicable.

ROOF AREA: price to include the structure, the predominant ceiling finish beneath it and the insulation, roofing, flashing, on top of it.

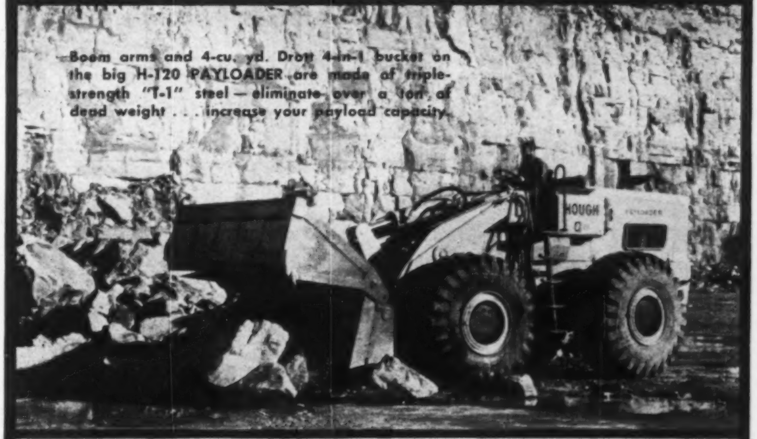
INTERIOR COLUMNS, free standing: list and compute cost separately for greater accuracy. Column spacing varies so with the utilization of the facility that to attempt to absorb their costs and prorate them over other areas is very inaccurate.

SURFACE FINISHES: list the especially difficult or expensive separately.

VERTICAL TRANSPORTATION, METAL WORK, MILL WORK, CASE WORK KITCHEN EQUIPMENT: list and price separately.

MECHANICAL, ELECTRICAL SERVICES: count probable fixtures and outlet requirements, plus the calculated air conditioning load, for a degree of accuracy greater than by computing the cost of such services as a percentage of the building cost or related to the square foot floor area.

Ease the profit squeeze



—Boom arms and 4-cu. yd. Drott 4-in-1 bucket on the big H-120 PAYLOADER are made of triple-strength "T-1" steel — eliminate over a ton of dead weight . . . increase your payload capacity.

with a PAYLOADER®

Owners report on 4-in-1 bucket performance:

We say a "PAYLOADER" equipped with the patented Drott 4-in-1 bucket combines shovel, clamshell, scraper and dozer action in a single tool. Enthusiastic owners spell out, in their own words, what this unique combination means to them in time and labor savings on-the-job:

Excavating—Vice-President says, "The 'PAYLOADER' with 4-in-1 bucket is the best piece of equipment we ever purchased. It will move more dirt than any other two competitive loaders that we have ever owned. It will do *anything*. We don't know how we ever did a job without it."

Construction—Owner says, "Our H-70 with 4-in-1 bucket is known as our third hand. This fact is proven daily by its unique versatility, practically eliminating hand labor. It can do clean-up work without excessive maneuvering. We have *controlled* material handling with the 4-in-1."

Pipeline— Foreman says, "The 4-in-1 versatility on rubber tires makes it the most useful single machine in my 15 years of pipe work."

Land Clearing— Superintendent says, "We had a lot of cedars to remove on this job. By just lowering the open bucket down over the top, then closing the clam, we yanked them out like pulling teeth. I figure the machine was making $100.00 an hour. We also took out and loaded ⅓ mile of old railroad ties in just 4 hours. With the clam open we peeled out 6 or 8 ties at a time, closed the clam and lifted them directly into the truck — just like taking the skin off an orange."

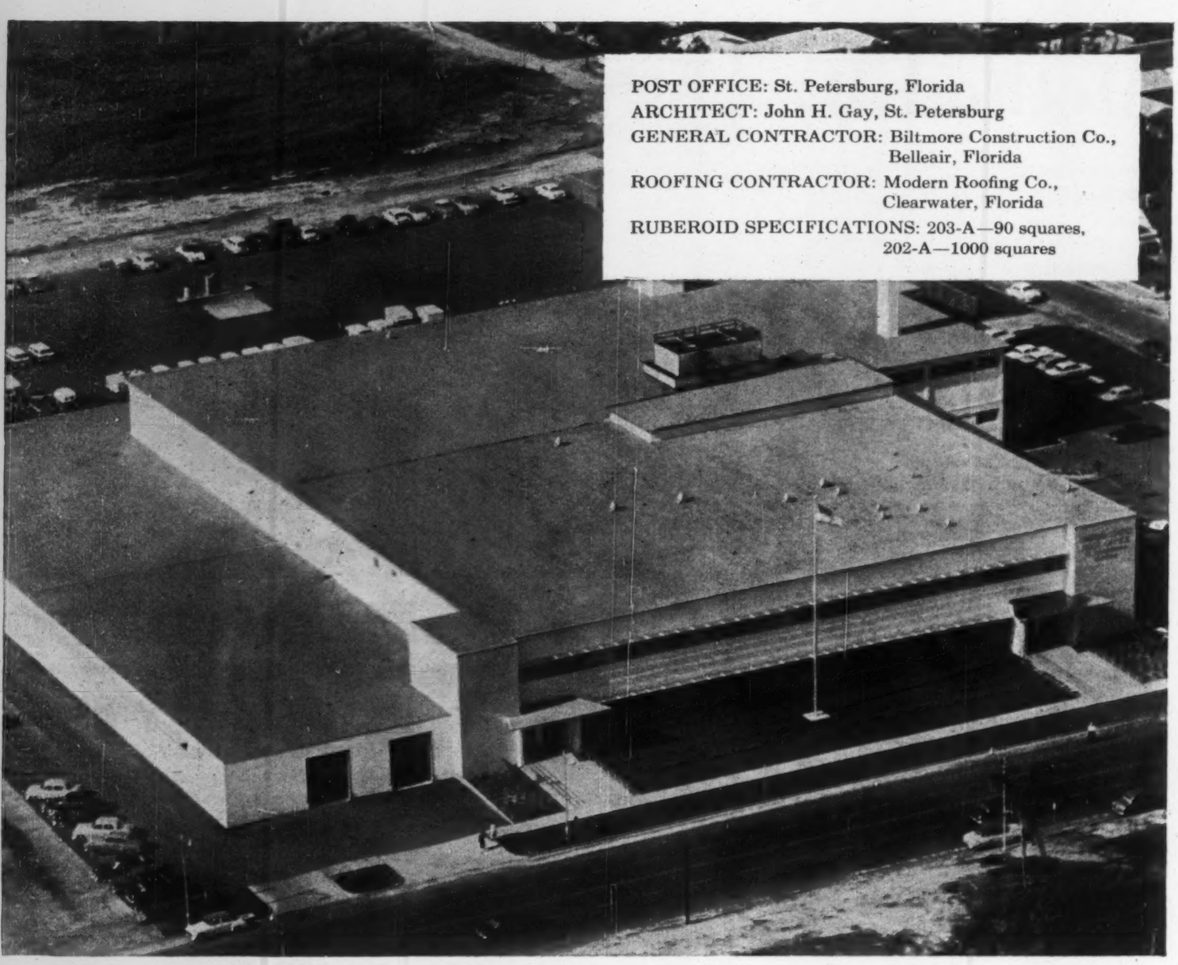
A sure way to "ease the squeeze" on your profits is to talk "PAYLOADER" with your Hough Distributor. He has the range of sizes to meet your needs, the widest assortment of attachments *plus* the most complete facilities in the tractor-shovel industry to *keep* your "PAYLOADER" investment profitable.

HOUGH®

THE FRANK G. HOUGH CO.
772 Sunnyside Avenue,
Libertyville, Ill.
SUBSIDIARY — INTERNATIONAL HARVESTER COMPANY

☐ Send PAYLOADER — 4-in-1 bucket data
☐ Send data on all PAYLOADER sizes

Name
Title
Company
Street
City State
9-B-2



POST OFFICE: St. Petersburg, Florida
ARCHITECT: John H. Gay, St. Petersburg
GENERAL CONTRACTOR: Biltmore Construction Co., Belleair, Florida
ROOFING CONTRACTOR: Modern Roofing Co., Clearwater, Florida
RUBEROID SPECIFICATIONS: 203-A—90 squares, 202-A—1000 squares

What's on top really counts when it's RUBEROID SPECIAL ROOFING BITUMEN

Main Post Office, Kansas City, Missouri. For 27 years—since 1933—a Ruberoid Special Roofing Bitumen roof has provided protection for this Kansas City landmark. Another example of the economy and durability of Ruberoid Roofing.

Special Roofing Bitumen provides rigidly controlled quality for any built-up roof. This alone adds many extra years of weather-tight, maintenance-free service for any type of building.

Add to this quality an engineered application by a Ruberoid Approved Roofer and you'll be assured of a built-up roofing combination that can't be topped in the industry today.

Specify Ruberoid Special Roofing Bitumen on *your* next project for assured all-weather performance and extra economy.

For detailed Ruberoid Specification Data, write: The RUBEROID Co., 500 Fifth Avenue, New York 36, New York.

The RUBEROID Co.®

see our catalog in S or write for copy

Eight-lane California Freeway

Six pedestrian underpasses are included in this award for additions to the San Diego freeway

This $16,237,675 contract for 11.9 miles of eight-lane freeway went to Guy F. Atkinson Co. of Long Beach, Calif., on a bid only 5% below the high of four bidders, Webb & White & R. B. Potashnick of Los Angeles. But it is $737,339—4.3%—under the second bidder. Work is for California's Department of Public Works.

The biggest part of the job will be construction of 7.4 miles of freeway between 0.3 mile south of Casiano Road and 0.3 mile north of Valley Vista Boulevard, south of the Ventura Freeway in Los Angeles. The roadway will be graded and surfaced with portland cement concrete on a cement treated base.

Work on this section also includes completion of the Mulholland Summit Cut and resurfacing portions of Sepulveda Boulevard. Five of the six pedestrian undercrossings will be on the northerly section of the stretch. Embankments and pedestrian undercrossings will also be built on a future freeway section north of the Ventura Freeway.

This project will connect with the previously completed sections to provide 14.3 miles of continuous freeway on the San Diego Freeway between Jefferson Boulevard in Culver City and Burbank Boulevard north of the Ventura Freeway.

Five traffic separation structures will be required and undercrossings will be provided at Chalon Road, about one-half mile north of Sepulveda Boulevard, at Brownfield Drive, and at Sepulveda Boulevard near Valley Vista Boulevard. Interchange and access facilities will be provided at several locations, and an overcrossing will be built at Rimerton Road.

Excavated material from this stretch will be used to construct embankments on the route of the freeway north of Burbank Boulevard.

Prevailing wage rates, plus fringe benefits for the Los Angeles area, include: common labor, $3.28 per hour; carpenters, $4.0275; structural iron workers, $4.305; $3.95 for cement finishers; $4.41 for power shovel operators; and $4.31 for operators of tractors over 30 hp.

The bidding included:

1C	Guy F. Atkinson Co., Long Beach, Cal	$16,237,675
2	R. A. Westbrook. Inc., Morrison-Knudsen Co., Inc. & C. MacClosky Co., Sacramento	16,975,014
4	Webb & White & R. B. Potashnick, L. A	17,110,658

Bids: 7-7-60

Items	Unit	Quantity	Unit Prices 1C	2
Barric met plate quad-rail, f	ea	6	$110.00	$85.00
Manholes abandon	ea	16	90.00	55.00
Trf stripes remov	lf	2,000	0.26	0.23
Sign structs remov	ls	job	1,000	250.00
Arch drain 72" remov & bulkhead	ls	job	21,000	25,000
Frames & covers salv	ea	18	45.00	30.00
Reconst met plate guard rail	lf	400	1.50	2.00
quadr barric	ea	6	50.00	50.00
Fence chain reconst	lf	4,706	1.00	1.00
chain link typ cl-6 gate 14"	ea	1	60.00	50.00
Sign channel str remov & reset	ea	12	40.00	10.00
Manhole adjust	ea	1	200.00	75.00
remodel	ea	5	200.00	150.00
Concrete remov	cy	1,850	5.00	4.00
Clear & grub	ls	job	678,400	1,500,000
Water supply dev	ls	job	670,000	50,000
Water apply	m gal	321,000	0.001	0.00
Excv rdwy	cy	7,900,000	0.35	0.345
surplus rdwy	cy	1,770,000	0.95	0.90
struct br & walls	cy	12,553	2.50	2.50
strm drn	cy	139,248	2.90	4.25
Struct backfill				
br & walls	cy	20,985	4.00	3.75
strm drn	cy	62,510	4.00	4.25
Exc ditch	cy	282	4.00	8.00
Haul "A"	myd	2,500,000	0.10	0.09
"B"	myd	18,950,000	0.09	0.09
Straw	t	294	50.00	47.00
Pipe galv sup line				
2½"	lf	883	1.70	2.00
2"	lf	627	1.45	1.50
Conduit asb CP 4"	lf	1,710	2.70	3.00
Finishing rdwy	ls	job	5,000	24,000
Aggregate sub b Cl 2	t	321,700	0.90	0.45
base Cl 3	t	164,500	2.70	2.24
road-mix CTB Cl A	t	31,900	3.15	2.45
Cl B	t	31,700	3.15	2.45
plant-mix CTB Cl B	t	43,700	3.50	3.88
Asph liq MC-2 cur seal	t	413	50.00	54.00
emuls fog sl ct	t	60	60.00	45.00
Aggregates tps A A C	t	68,500	5.70	5.75
Paving asph A.C.	t	3,610	5.70	5.75
Asph conc dikes plac	lf	81,700	0.27	0.20
A.C. misc areas plac	sy	330	3.00	1.00
Liq asph SC-2 pr ct	t	183	50.00	37.00
Asph emul pnt. bdr	t	30	60.00	134.00
Portland cement	lf	115,300	4.00	3.84
Conc pav 0.50′ thick	sy	1,550	3.50	2.00
0.67′ thick	sy	152,300	1.90	1.73
0.75′	sy	153,500	2.15	1.94
Weak plane joints saw trans	lf	183,200	0.12	0.1125
Tiebars	ea	68,700	0.35	0.26
Piling steel	lf	10,200	4.20	4.50
Piles steel drive	ea	353	100.00	150.00
Cast-in dril-hole conc pil				
36"	lf	36	24.00	45.00
30"	lf	36	20.00	40.00
Shoring for channel	ls	job	85,000	98,000
Concrete, cl A				
minor structs	cy	1,600	130.00	145.00
structures	cy	29,700	28.00	46.00
bridge	cy	13,745	66.00	59.00
sign foundation	cy	133	60.00	38.00
Westwood chan	cy	3,750	27.00	39.00
Bri pier clean & fin	sf	11,000	0.22	0.15
Rubber waterstops	lf	2,722	1.50	2.00
Steel bar, reinf	lf	3,850,000	0.089	0.095
bridge	lb	3,035,000	0.089	0.095
Mesh reinf	sy	950	1.00	1.00
Mortar, air blown	cy	90	65.00	48.00
Membrane waterprof	sy	837	4.00	4.50
Misc met for Bri	lf	8,975	0.45	0.32
Steel, sign structs	lb	167,085	0.40	0.40
for road sign	lb	31,000	0.45	0.33
Wood posts road sign	fbm	7,720	1.00	0.60
Signs on struct & electroliers mount	ea	13	40.00	20.00
Contrast treatment	sy	3,550	0.40	0.50
RCP Cl III 15"	lf	107	7.50	7.00
18"	lf	198	8.00	6.80
24"	lf	8,513	9.00	8.76
27"	lf	1,752	10.00	10.25
30"	lf	1,159	11.00	11.60
33"	lf	587	12.50	13.00
36"	lf	276	15.00	15.00
54"	lf	235	26.00	28.00
60"	lf	581	30.00	34.00
72"	lf	566	36.00	41.00
Cl IV 39"	lf	35	21.00	21.00
54"	lf	868	27.00	29.00
63"	lf	629	34.00	37.00
66"	lf	486	36.00	40.00
72"	lf	271	42.00	46.00
Cl V 66"	lf	1,072	40.00	44.00
CMP 16 gauge 12"	lf	70	5.00	3.40
15"	lf	55	5.00	3.75
18"	lf	678	5.50	4.50
21"	lf	78	6.00	5.00
14 guage 24"	lf	760	7.50	7.00
42"	lf	416	40.00	35.00
12 guage 24"	lf	12	11.00	9.00
CMP 18" bit. coat pav. invert 16 ga	lf	240	6.00	5.60
14 ga	lf	886	7.00	6.20
24" 16 ga	lf	67	8.00	7.00
14 ga	lf	6,085	8.70	8.20
12 ga	lf	588	11.00	10.25
30" 14 ga	lf	1,058	11.00	10.00
12 ga	lf	1,083	13.00	12.50
10 ga	lf	268	16.00	15.25
36" 12 ga	lf	130	17.00	15.00
10 ga	lf	293	19.00	18.00
8 ga	lf	293	22.00	21.00
42" 14 ga	lf	176	15.00	14.00
12 ga	lf	409	17.50	17.70
8 ga	lf	861	24.00	24.50
48" 12 ga	lf	555	21.50	20.20
10 ga	lf	316	27.00	24.50
8 ga	lf	261	31.00	28.00
54" 12 ga	lf	49	29.00	24.00
8 ga	lf	280	36.00	33.00
72" 10 ga	lf	65	42.00	40.00
CMP 14 ga asb bond bit. coat	lf	102	12.00	11.50
PMP underdrn 16 ga 8"	lf	22,300	2.30	2.20
14 ga 30" asb. bond bit coat	lf	5,452	10.00	10.70
Filter material typ A	t	6,700	2.70	3.70
typ B	t	22,700	2.30	4.15
Anchor assembl 12"	ea	3	35.00	28.00
15"	ea	7	36.00	33.00
18"	ea	32	38.00	33.00
21"	ea	4	40.00	33.00
24"	ea	66	42.00	33.00
30"	ea	17	45.00	33.00
Met flared end section				
16 ga 12"	ea	2	48.00	40.00
18"	ea	2	65.00	47.00
14 ga 24"	ea	1	90.00	62.00
MH precast conc 36"				
Class II	lf	136	20.00	22.00
Class IV	lf	216	21.00	27.00
Misc iron & steel	lb	105,600	0.30	0.34
Pipe Xtr str clay sew				
6"	lf	92	11.00	14.00
8"	lf	1,560	8.00	16.00
10"	lf	2,082	10.00	18.00
42"	lf	4,592	64.00	80.00
Manhole "S" drop	ea	1	500.00	750.00
"B"	ea	10	300.00	700.00
Terminal manholes "O"	ea	3	300.00	700.00
Junction chambers "F"	ea	2	300.00	600.00
Chimney pipes "D"	ea	6	200.00	250.00
MH, special sewer	ea	11	2,500	3,000
transition	ea	1	3,000	3,000
By-pass structures	ea	8	9,000	9,000
Conc Cl C pipe reinf	cy	200	46.00	30.00
42" outf sew	cy	2,320	25.00	30.00
Rock slope prot. light method B	cy	154	20.00	12.00
Aggregate, course	t	16,064	2.90	3.60
Quarry st remov & repl.	cy	4,685	3.70	1.75
Conc Cl B, curbs & swlk	cy	5,200	34.00	35.00
Fence, chain link				
type Cl-6	lf	107,900	1.60	1.76
72" temp	lf	5,775	1.20	1.25
36" chan	lf	732	1.00	1.00
Gate, chain link walk	ea	16	60.00	60.00
Gates, chain link				
Type Cl-6 10′	ea	20	90.00	100.00
14′	ea	25	130.00	140.00
Survey monuments	ea	31	22.00	25.00
Markers guide	ea	828	6.00	6.50
culvert	ea	81	6.00	6.50
Monument marker	ea	31	6.00	6.50
Railing, guard, met bea.	lf	4,700	4.20	4.50
pipe bridge	lf	39	10.00	8.00
pipe typ 3A	lf	281	10.00	11.00
barrier typ 1	lf	2,161	9.00	8.00
typ 2	lf	269	12.00	11.00
Barrier, cable-chain link	lf	30,550	3.50	3.50
Slats, headlight glare protection	lf	5,410	0.50	2.50
Traffi sig. hwy light & sig illum syst	ls	job	200,000	220,000
Washing equipment	ls	job	3,000	3,500

YOUR AD
must
APPEAR
HERE

CONTRACTORS REGISTER
USED BY
ARCHITECTS
GEN'L CONTRACTORS
ENGINEERS
SUB-CONTRACTORS
INDUSTRIAL PLANTS
UTILITY CO'S
BANKS—REAL ESTATE
GOV'T AGENCIES

. . . and here's why

1 **It blankets the construction market** — reaching every important company concerned with the building field.

2 **It covers the most profitable areas** — circulation mainly in New York, New Jersey, Connecticut, Boston, Philadelphia, District of Columbia and adjacent territory.

3 **It is the "blue book" of the industry** — published annually since 1913—looked *for* eagerly year after year—looked *at* constantly by key buyers and specifiers.

4 **Its cost is figured in pennies** —less than ONE CENT per copy for the entire year...

Closing Date October 31

COST FOR ENTIRE YEAR

1 Page—5x7½"	$300.00
1/2 Page—5x3¾"	185.00
1/4 Page—5x1⅞"	110.00
1/8 Page—5x15/16"	70.00

CONTRACTORS REGISTER
60 E. 42nd St., New York 17, N. Y.
MUrray Hill 2-6598

CONTRACTORS REGISTER
BUILDING AND CONSTRUCTION

CIRCLE 96 ON READER SERVICE CARD

Iron removal plant included in . . .

Iowa Waterworks Bids

All bids for the $47,093 Keosauqua, Iowa, waterworks improvement project iron removal plant, and water main extension and plant drain were below the engineers estimate. Donald E. French and Associates, Kahoka, Mo., are the consultants.

The Louis F. Whitney Pump Service of Cedar Rapids took the iron removal plant contract with a low of $20,241, 17% under the estimate. Bidding on alternate plant equipment was varied, depending on the make and model specified in the bids.

Brooks Construction Co. of Kahoka, Mo., will handle the water main extension and plant drain jobs for $26,852, 5.8% below the estimate, and 6% under Vernon G. Wells' second low.

Prevailing wage rates for the entire project are $2.25-$3.00/hr for erectors, and $2.80 for plumbers, all other labor is subcontracted.

The bidding included:

Iron Removal Plant

1C	Louis F. Whitney Pump Ser., Cedar Rapids, Ia	$20,241
2	C. L. Carroll Co., Inc., P. O. Box 1036 Des Moines 13, Iowa	22,662
4	Thorpe Well Co., Des Moines, Iowa	24,097
EE	Donald E. French & Assoc., Kahoka, Mo	24,491

Bids: 7-18-60 Items	Unit	Quantity	Unit Prices 1C	 2
Old found rem	ls	job	$200.00	$256.00
Exc, struct earth	cy	107	1.40	3.00
Concrete masonry	cy	33	60.00	80.00
Steel, reinf	lb	3,000	0.12	0.17
Aerator	ls	job	910.00	2,020
Pump, high service	ls	job	1,190	1,115
Filters	ls	job	6,086	5,450
Chlorinator	ls	job	1,285	1,460
Piping, other plant	ls	job	992.00	1,350
Plumbing	ls	job	710.00	620.00
Plnt contrls & elect sys	ls	job	704.00	1,040
Heating	ls	job	974.00	1,060
Building	ls	job	4,700	4,820

Bids on Alternate Equipment:

Base bid* and alternates

Item	Make & Model	Unit Price
Aerator	General Filter	$1,268
	Waterite Fiberglass	2,020
	Waterite	1,725
	Whitney A-200	910*
	Elgin 60"	2,584
Pump high ser	Layne	1,187
	FBM	1,115
	FBM	836
	FBM 6977	1,190*
	FBM Centrifugal	458
	Elgin	5,500
Filters	Gen. Filter	5,196
	Waterite	5,450
	Waterite	5,100
	Whitney	6,086*
	W & T	1,440
	Gen. Filter ⅜" heads ¼" shel-ded	221
Chlorinator	W & T A-751	1,690
	W & T 1,460	1,460
	Fish & Por 1053-A	1,279
	Fish & Por 1170-C	1,285*
	W & T A-741 ded	145
	W & T A-741	1,300
	Fish & Por	1,185

Water Main Extension & Plant Drain

1C	Brooks Const. Co., Kahoka, Mo	$26,852
2	Vernon G. Wells, Oskaloosa, Iowa	28,452
EE	Donald E. French U Assoc., Kahoka, Mo.	28,483

Bids: 7-21-60 Items	Unit	Quantity	Unit Prices 1C	 2
CIP 4"	lf	2,820	$2.25	$2.40
6"	lf	2,160	3.50	3.30
8"	lf	1,550	4.24	4.50
Valves 4"	ea	1	50.00	80.00
6"	ea	3	64.98	100.00
Slv & vlv 6" cut-in	ea	1	225.00	167.88
4" tap	ea	3	147.21	164.00
6" tap	ea	1	194.44	200.00
8" tap	ea	1	245.00	257.33
Slv 6" tap & vlv 4"	ea	2	174.74	176.77
Valve boxes	ea	12	25.00	40.00
Hydrants	ea	11	170.00	150.00
Cl fittings	lb	2,400	0.34	0.40
CIP Boring 8"	lf	80	10.00	8.00
Trench & BF 6'–8'	lf	60	1.00	1.50
8'–10'	lf	70	1.25	1.75
10'–12'	lf	60	1.50	2.00
12'–14'	lf	60	2.00	2.75
14'–16'	lf	57	2.50	3.50
VCP sew 8"	lf	193	1.15	1.15
CIP sew 8"	lf	118	2.89	2.89
MH top 6'	ea	3	170.00	175.00
Xtra depth	lf	18	16.00	17.50

Glue Laminated Stringers Cost $500/Mfbm

Squirrel Creek Bridge in Mt. Hood National Park, Ore., will be built for the U. S. Forest Service by Edwin Maerz of Salem, Ore. for $15,336. R. F. Grefe of Portland, Ore., assistant regional forester, is the engineer.

The 84.5-ft long, single lane bridge will use glue laminated stringers, a treated timber deck, and concrete foundations. Class A concrete for foundations has a cement content of 6.5 sacks/cy.

The bridge will be located approximately 70 mi SE of Estacada, Ore., and will be used principally for timber access.

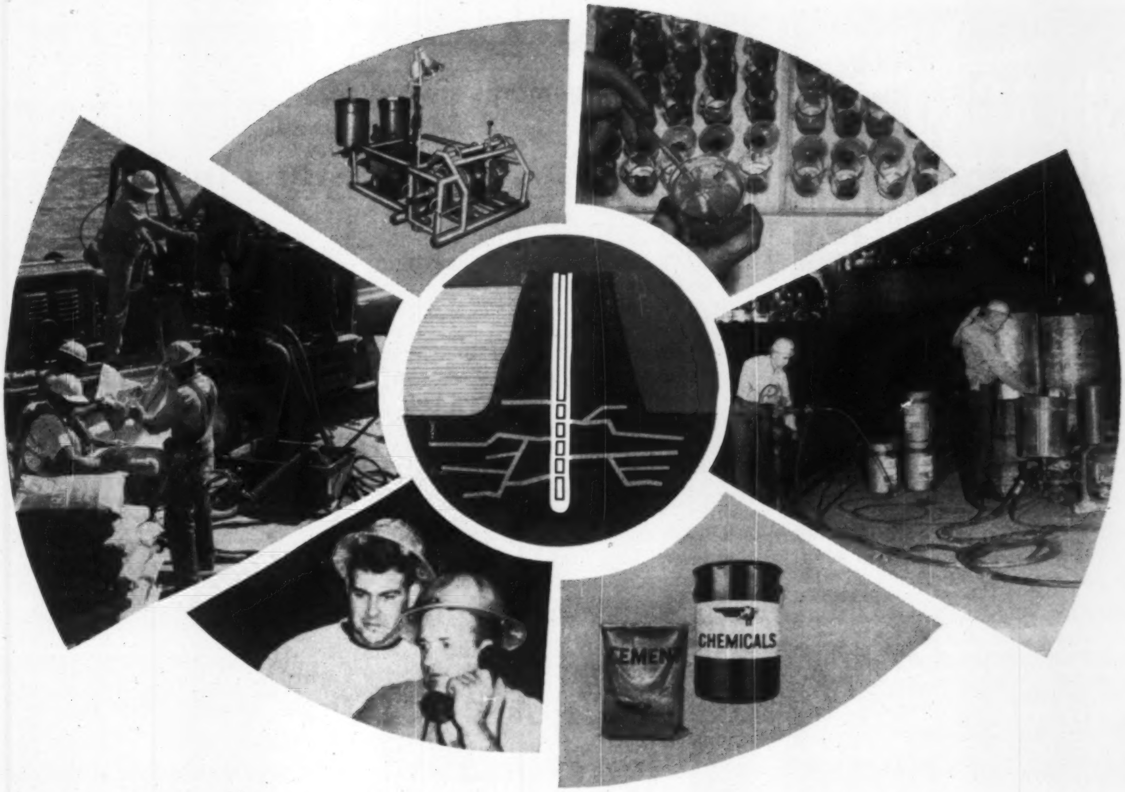
Minimum wage rates for the project are: carpenters, $3.46/hr; cement masons, $3.48/hr; laborers, $2.75; from $3.17-$3.93 for power equipment operators; $3.25-$3.55 for grades of truck-drivers; power shovel operators, $3.81-$4.33; $3.51 & $3.75 for tractors; and painters, $3.25/hr.

The low bid included:

1C	Edwin Maerz, 970 Commercial St., Salem, Ore.. $15,336

Bids: 6-15-60	Unit	Quantity	Unit Prices 1C
Exc, uncl for struct & backfills	cy	62.7	$20.00
Concrete, cl A	cy	14.0	100.00
Steel, reinforcing	lb	2,500	0.15
structural	lb	7,100	0.35
Stringers, glued laminated	mfbm	10.14	500.00
Timber, treated	mfbm	15.02	300.00
untreated	mfbm	0.41	600.00

Completion time: 110 calendar days



FULL SCOPE OF SERVICE

Halliburton *Full Scope* Pressure Grouting Service offers a balanced selection of the best grouting methods and materials available today. To give you the complete picture of the many benefits of this outstanding service, Halliburton has prepared a comprehensive grouting brochure which is available now on request. A few of the advantages offered by Halliburton Pressure Grouting Service, and presented in this brochure, are outlined below.

CHEMICAL GROUTING

. . . research designed and job proven for helping control unwanted water infiltration, seepage and leakage. Chemical grouts offered include HYDRO-LOK (PWG), HG-10 RESIN and BLOX-ALL. These low viscosity grouting agents contain an internal catalyst allowing injection as a single fluid for timed reaction. This permits the chemical grout to be injected in a single operation for closer control and more uniform setting throughout the entire permeability of the formation than with agent-plus-catalyst double injection chemical methods.

CEMENT GROUTING

. . . with Halliburton cements, retarders and accelerators for helping to seal large fissures and solution channels in water-bearing formations . . . and special water-reactive cement grouts for use where troublesome water flows are encountered. These products — together with Halliburton research and know-how — give the greatest selectivity available for choosing the right grout — light or heavy, and the best setting characteristics — fast or slow.

PUT THESE PRODUCTS AND TECHNIQUES TO WORK FOR YOU. When soil stabilization or water control problems point to pressure grouting . . . call on Halliburton . . . and Compare the Results!

"275 LOCATIONS TO SERVE YOU"

HALLIBURTON
PRESSURE GROUTING SERVICE
A DIVISION OF HALLIBURTON COMPANY • DUNCAN, OKLAHOMA

CIRCLE 97 ON READER SERVICE CARD

announcing:
SHLAGRO
STOCK STEEL
DOUBLE-CONVEX
WARREN TRUSS
LO-RISE!
SPANS 65' to 150' COLUMN FREE!
LONG SPANS SHIPPED KNOCKED DOWN! NO SHIPPING PROBLEMS!
LOW COST PER SQ. FOOT!
EASY FIELD ASSEMBLY
SIMPLE BOLT CONNECTIONS
FOR: BOWLING ALLEYS, SHOPPING CENTERS, WAREHOUSES, ETC.
Write today for Catalog 175

another PRODUCT by the PIONEERS of SQUARE columns!
SHLAGRO
STEEL PRODUCTS CORPORATION
SOMERVILLE, MASS.

I am interested in Shlagro Double-Convex Warren Truss and other Shlagro Products checked below:

☐ #175 — DOUBLE-CONVEX WARREN TRUSS
☐ #100 — STOCK STEEL ROOF TRUSSES
☐ #125 — TIED ARCH-BEAM
☐ #150 — STOCK STEEL LONGSPAN JOISTS
☐ #200 — SQUARE STEEL COLUMNS
☐ #225 — KARRI-MORE SQUARE COLUMNS
☐ #250 — SHLAGRO SHEAR HEADS
☐ #300 — STOCK STEEL TURNTABLES
☐ #350 — SCAFFOLDING
☐ #375 — SHLAGRO NO-DIAGONAL LONGSPAN JOISTS
☐ #400 — EGG-SHELL STEEL PLATE ROOFS
☐ #450 — SHLAGRO DOME STRUCTURES
☐ #500 — STOCK STEEL RIGID FRAMES
☐ #550 — STOCK STEEL VERTICAL MEMBER TRUSSES
☐ #600 — STEEL VERTICAL LIFT DOORS
☐ #650 — NO SHELL PRE-CAST FIREPROOF REINFORCED CONCRETE COLUMNS
☐ #700 — STEEL FLOORSPAN GIRDERS
☐ #725 — SHLAGRO TRIANGULAR GIRDER
☐ #750 — STEEL WELDED PIPE TRUSSES
☐ #775 — KARRI-MORE BEAM AND GIRDER
☐ #800 — STOCK STEEL MOMENT CONTOUR BEAM AND GIRDER
☐ #825 — SHLAGRO TAPERED GIRDER
☐ #850 — PREFAB BUILDINGS FLAT ROOF
☐ #875 — PREFAB BUILDINGS PITCH ROOF

name__________
title__________
____

Please attach to your professional letterhead and mail to:
SHLAGRO STEEL PRODUCTS CORP.
SOMERVILLE, MASS. EN-9

Tight bidding marks award for . . .

North Dakota Missile Facility

The $815,921 low of the Fred R. Comb Co. of Minneapolis took the Grand Forks, N. D., Air Force Base contract to build SAC missile facilities. Comb's bid was only 0.5% below the second low of Otto J. Eickhof & Sons of Crookston, Minn., and 0.8% below H. Halvorson, Inc. of Grand Forks, third of five bidders.

Work includes site preparation, drainage, general building construction, parking areas, and pertinent connecting utilities.

The service shop will be 155x160 ft, the run-up shop, 76x62 ft.

Prevailing wage rates for the project: laborers, $2.02 per hour; bricklayers, $3.60; carpenters, $2.72; electricians, $3.45; $3.57 per hour for structural iron workers, and $3.42 for reinforcing; sheet metal workers, $2.50; lineman $3.76; and $2.82-$3.15 for power equipment operators.

The bidding included:

1C	Fred R. Comb Co., Minneapolis, Minn	$815,921
2	Otto J. Eickhof & Sons, Inc., Crookston, Minn.	819,538
5	Gunnar I. Johnson & Son, Minneapolis, Minn.	867,118
EE	Government estimate	741,109

Bids: 6-16-60 Items	Unit	Quantity	Unit Prices 1C	2
Missile run-up shop, complete[a]	ls	job	$125,000	$119,051
Service shop, complete[b]	ls	job	342,000	335,475
Amonia transfer facil, complete[c]	ls	job	21,000	29,702
Power check pad, complete[d]	ls	job	9,500	4,834
Elect dist sys, complete[e]	ls	job	36,000	36,700
Pav remov & replac	sy	10	22.50	23.40
Pipe line, water 10"	lf	1,800	11.25	11.70
8"	lf	65	9.60	9.98
6"	lf	270	8.50	8.84
2"	lf	165	8.00	8.32
1½"	lf	15	8.00	8.32
Hydrants, fire	ea	4	495.00	514.80
Vlv boxes & gate vlvs 10"	ea	2	320.00	332.80
2"	ea	2	160.00	166.40
Ser stops & boxes 1½"	ea	1	90.00	93.60
Vlvs, post indicat 8"	ea	1	420.00	436.80
6"	ea	2	340.00	353.60
Pipe sew, sanitary 8"	lf	625	20.00	20.80
6"	lf	230	8.00	8.32
Drain tile	lf	180	4.20	4.37
Septic tanks	ea	1	1,800	1,872
Boxes dist	ea	1	320.00	332.80
MH, sanitary sew	ea	2	840.00	873.60
Connect to exist MH sanitary sew	ea	1	260.00	270.40
Subdrains	lf	2,440	3.30	3.43
Risers, flush & observ	ea	9	125.00	130.00
Drains, storm 27"	lf	735	22.00	22.88
21"	lf	540	18.50	19.24
15"	lf	320	9.90	10.30
12"	lf	25	8.30	8.63
building	lf	70	8.00	8.32
Inlets, curb tp	ea	5	560.00	582.40
area tp	ea	1	490.00	509.60
Filter, granular course	sy	10,185	2.74	2.85
Subbase, course	sy	10,185	4.95	5.15
Base, course	sy	8,800	3.01	3.13
Bit prime coat	gal	3,525	0.28	0.29
Surface, course	sy	8,800	2.46	2.56
Bit materials	gal	14,600	0.28	0.29
Conc, curb & gut	lf	4,915	3.10	3.22
curb & gut rem	lf	60	1.00	1.04
walk	sf	1,465	0.72	0.75
Walk, double purpose	sf	1,620	1.09	1.13
Excavation	cy	9,100	0.95	0.99
Borrow	cy	11,800	1.47	1.53
Seeding	ls	job	9,000	9,360
Planting	ls	job	5,580	5,803
Ground power equip facility complete[f]	ls	job	1,500	1,600

Completion time: 360 working days
Liquidated damages: $100 per day

a. GAM 77 facilities, incldíng struct exc & backfill, conc aprons, wing walls, steps, stoops, fuel oil storage tank, utilities stubbed out.
b. GAM 77 including struct exc & backfill, conc steps, stoops, ramps, fuel oil storage tank, utilities stubbed out.
c. GAM facilities, inclding struct exc & backfill, hose rack, amonia storage tank, pipe support, serv piping, utilities stubbed out.
d. inclding struct exc & backfill, conc slab, drain fill, tie-down anchor, anchor bolts, existing fence remov & blast pad.
e. inclding building services.
f. Entire work in existing ADC shop.

Canton, Mass., Sewers Draw Twelve Bidders

N. Cibotti & Sons Co., Hyde Park, Mass., bid low at $108,297 to build 11,000 lin ft of 8-in. and 10-in. lateral sewers for the city of Canton. This was 8% below the engineer's estimate, 5% under the second low of J. J. Struzziery Co. of Dedham, Mass., and 32% lower than A. Baruffaldi Co. of Somerville, high of twelve bidders. Whitman & Howard, Inc., Boston, is the consulting engineer.

Average depth of the sewers will be 9 ft.

The engineer reports average conditions of ledge and water, no unusual problems.

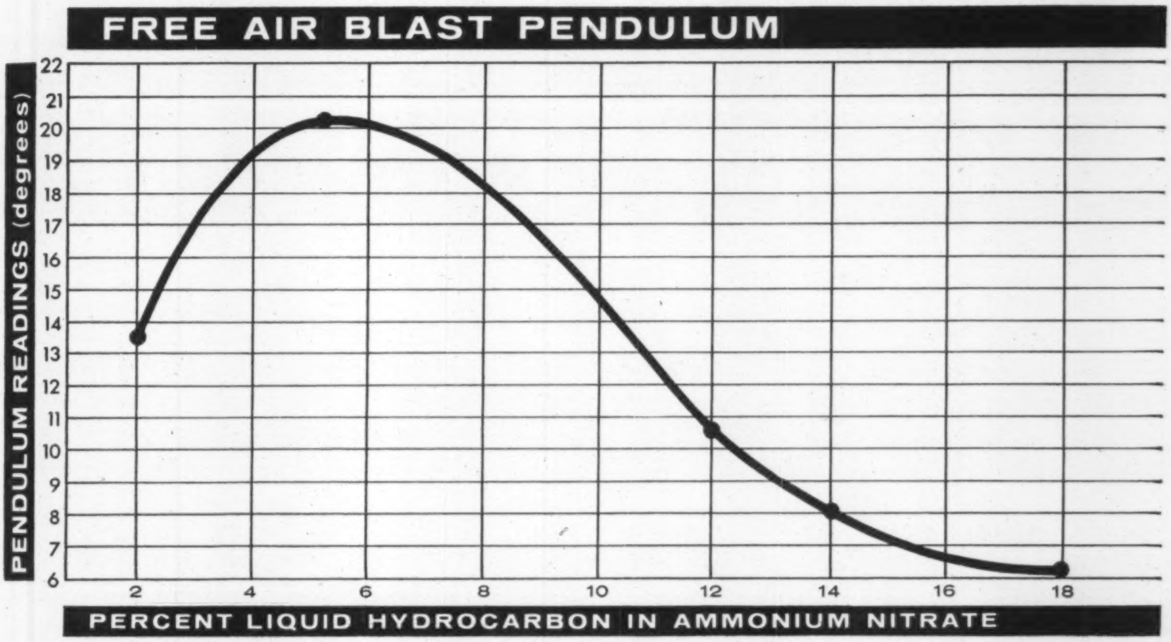
Wage rates listed for the project include: skilled labor, $4.10 per hour; semi-skilled, $3.725/hr; and $2.75/hr for common labor.

The bidding included.

1C	N. Cibotti & Sons, Hyde Park, Mass	$108,298
2	J. J. Struzziery Co., Dedham, Mass	114,010
12	A. Baruffaldi Co., Somerville, Mass	158,135
EE	Whitman & Howard, Boston, Mass	118,000

Bids: 7-26-60 Items	Unit	Quantity	Unit Prices 1C	2
ACSP C12400 f&l 8"	lf	9,050	$5.75	$6.40
10"	lf	2,200	7.00	8.50
MH std incl 5 drop f&i	ea	44	300.00	325.00
Asb cem chim pipe f&i 6"	lf	30	10.00	6.00
Gravel, borrow	t	100	2.00	1.00
Scrnd stone	t	100	5.00	2.50
Exc ledge & bldr, repl with fill	cy	800	10.00	8.00
Conc exl of MH b & chim encsmt f&p	cy	20	10.00	20.00
Timber sheeting & shor f&lip	ft	10,000	1.00	10.00
Exc & BF, trench	cy	50	4.00	4.00
Calcium chloride	lb	2,000	0.10	0.08
Conc, bit, surf 1" temp f&p	lf	1,000	1.00	0.40
2½" perm f&p	lf	11,000	1.50	1.30
Trf police uniformed	hr	200	2.75	3.00

Completion schedule: 100 calendar days
Liquidated damages: $50.00 per day



As this graph shows, blast output is closely related to the amount of fuel oil absorbed by the solid material. If it is too dense, too little fuel oil is absorbed and optimum blast energy cannot be released. Spencer N-IV has a special structure which allows it to absorb fuel oil more evenly and completely and release greater blast energy.

Why Spencer N-IV And Fuel Oil Deliver Greater Blast Output Than Higher Density Materials:

Because it soaks up fuel oil better, Spencer N-IV gives more blast energy than higher density, non-absorbent material

Do higher density materials really produce more blast energy? No, say blasting experts.

Actually, the opposite is true. When higher density material is used, the net result is really lower blast output. According to *Military Explosive*, published by the Department of the Army:

> **"The sensitivity of ammonium nitrate to initiation decreases with increase in loading density. If the density exceeds 0.9 charges of 1 to 3 pounds cannot be detonated completely by large booster charges, and larger quantities cannot be detonated completely at densities greater than 1.1."**

The reasons for this are clear. When a higher density, non-absorbent material is used, the outer layer of the particle is coated with too much fuel oil. This retards the efficiency of the explosion when the blast begins.

In addition, the inner layers of the higher density material don't get enough fuel oil. The mixture is too lean so that maximum blast energy cannot be released.

According to extensive research investigations, Spencer N-IV, when mixed with the recommended 6% fuel oil, delivers 20% to 25% more blast energy than equal charges of other solid ammonium nitrate-fuel oil mixtures. There are two main reasons for this:

1. **Lower density which provides greater ease of detonation.**

2. **Special prill structure which allows fuel oil to be absorbed more evenly.**

Many other prilled ammonium nitrates have coatings of diatomaceous earth. This coating tends to absorb more fuel oil on the outside of the particle. It reduces the distribution of oil within the particle.

Because Spencer N-IV has no diatomaceous earth coating, fuel oil can penetrate it more evenly. This results in a better fuel balance and much higher blast efficiency.

SPENCER®

Spencer Chemical Company
401 Dwight Building
Kansas City 5, Missouri

Please send me full details on Spencer N-IV as an ingredient in blasting.

Name____________________

Firm____________________

Address____________________

City__________ State__________

Four-span deck girder for Chicago's . . .

South Route Expressway

A low of $1,186,028 by Superior Concrete Construction Co., Chicago, took the contract for the west leg of the South Route Expressway at the Wentworth Avenue grade separation. Superior's bid for the four-span continuous deck girder was 6% below Arcole Midwest Corp. of Evanston, Ill., second at $1,265,539, and 26% under the high of twelve bidders, L. B. Strandberg & Son Co., Chicago. The Cook County Highway Department was the engineer.

The deck, of 44-ft-wide reinforced concrete slabs, provides a 32-ft roadway, a 7-ft 6-in. walk, and a 2-ft 6-in. safety walk together with handrails. Span lengths are 119 ft 5½ in., 148 ft 6¾ in., 174 ft 3½ in., 169 ft 2⅜ in. It will be part of a system of expressways in Cook County. A great deal of sheathing will be required due to various stages of construction, and to keep traffic flow at a normal pace.

Class X concrete will conform to state specifications adopted in January 1958, and cast iron pipe with federal specifications WW-P-421 for pipe; water, cast iron, bell & spigot.

Prevailing wage rates include: skilled, $4.25 per hour; semi skilled, $3.25/hr; and $3.10/hr for common labor.

The bidding included:

1B	Superior Concrete Constr. Co., Chicago, Ill	$1,186,028
2	Arcole Midwest Corp., Evanston, Ill	1,265,539
12	L. B. Strandberg & Son Co., Chicago, Ill	1,609,473

Bids: 8-2-60		Quan-	Unit Prices	
Items	Unit	tity	1B	2
Conc, cl X	cy	56,581	$50.60	$48.90
Bars, reinforcement	lb	637,500	0.11	0.13
Steel, struct f&e	lb	1,951,000	0.17	0.185
Handrail, met f&e	lf	1,211	15.20	16.45
Fence, chain link tp III	lf	1,280	6.05	6.40
Embank, sand or grvl	t	14,230	3.90	2.15
CMP perf 6"	lf	1,536	1.85	2.30
Exc, cl A for structr	cy	4,978	1.95	4.25
modified	cy	13,126	1.95	2.15
special	cy	185,154	0.85	1.02
Sheet piling, temp	ls	job	13,200	65,500
Embank, porous gran	cy	1,812	4.20	4.15
Warning strip, corr	sy	54	17.50	17.15
Drains, floor	ea	4	105.00	120.00
Conc, comb curb&gut tp3A	lf	9	3.50	3.10
tp3	lf	4,768	2.80	2.70
Name plates	ea	2	55.00	55.00
Pavement fabric	sy	54	1.00	1.00
Conc, P cmt pav 16½"-10½"-16½"	sy	264	9.00	9.45
base course 9"	sy	7,415	5.65	5.80
driveway 8"	sy	118	6.10	6.50
sidewalk 5"	sf	6,7[illegible]	0.67	0.65
8"	sf	126	0.82	0.75
Bit mat, prime coat	gal	828	0.40	0.20
conc, bind course	t	704	14.00	9.30
surf course sub cl I-11	t	575	14.00	9.95
Bind, leveling	t	3	17.00	24.00
Aggregate, prime coat	t	17	12.00	8.00
Curb lej	sf	563	0.87	0.95
Sub-base gran mat tp A	t	1,806	4.00	3.25
Timber, misc	mfbm	4.7	550.00	415.00
Barricade, wooden	lf	360	2.00	2.25
Section markers	ea	2	40.00	30.00
Tree remov spl 6"-15" φ		391	3.10	1.40
over 15" φ		325	5.10	2.00
Sodding	sy	3,715	0.57	0.90
Seeding, complete	acre	0.02	130.00	330.00
Watering, supplemental	units	13	9.00	6.60
Topsoil	cy	120	4.25	4.05
Fertilizer nutrients	t	0.1	600.00	660.00
MH, to be adjusted	ea	12	45.00	38.00
fill existing	ea	1	22.00	20.00
CB, to be adjusted	ea	1	45.00	38.00
fill existing	ea	14	22.00	20.00
Inlets, fill existing	ea	7	16.00	15.00
Drains & sew over 12" plug existing	ea	2	80.00	45.00
MH, tpA 4' φ closed lid tp 1 frame	ea	3	295.00	290.00
tp 5 frame	ea	6	240.00	225.00
CB, tpA-2 4' φ frame & grat tp 34	ea	1	315.00	375.00
tp 31	ea	1	285.00	360.00
tp5 frame open lid	ea	24	270.00	225.00
Inlets, tpA, tp5 f open lid	ea	1	150.00	110.00
Sew, storm (ASTM C200-57T) tp 1 8"	lf	7	8.00	5.00
tp 2 8"	lf	316	9.00	4.00
10"	lf	342	6.25	4.55
12"	lf	511	9.20	5.45
RCP cl III tp 2 10"	lf	8	7.00	7.25
12"	lf	4	8.00	9.00
tp 3 15"	lf	78	10.40	8.80
tp 4 15"	lf	40	14.50	12.55
24"	lf	17	17.00	34.35
CIP, B&S cl 150 6"	lf	142	16.30	11.40
8"	lf	21	8.10	8.10
Trench, backfill	cy	623	6.60	1.50
Drains & sew 12" or less plug existing	ea	20	38.00	35.00
CIFr, tp 5, incl closed lid	ea	4	70.00	60.00
Frames & grates to be adj	ea	1	45.00	38.00
Cond, CA 3½" enc (6)	lf	1,300	16.00	16.10
(8)	lf	32	23.00	21.50
(4)	lf	220	11.00	11.00
susp (4)	lf	630	21.60	16.80
Cnd, dir bur, rig steel 3"	lf	10	0.00	4.15
2½"	lf	430	3.25	3.45
2"	lf	320	2.75	2.50
in struct, rig steel 12"	lf	750	2.15	2.90
Trenching & backfilling	lf	485	0.50	1.35
Fdn, for light stnd bal housing base	ea	2	88.00	105.00
for light stnd anch base	ea	20	88.00	105.00
for fire alarm box	ea	1	88.00	65.00
Sidewalk, jct box 24" x 12" x 10"	ea	7	145.00	120.00
MH, city of Chicago tp, 3' x 4' x 4"	ea	4	640.00	610.00
6'-2" x 6'-6" x 7'-0"	ea	2	820.00	725.00
Special	ea	2	290.00	1,365
MH frame, repl cov & neck	ea	1	52.00	100.00
Handhole	ea	1	640.00	109.25
Elect jct box 4" x 6" x 4"	ea	6	73.00	16.00
Sheet pil at CTA sub-sta.	ls	job	19,000	7,750
Conc base Pcmt HES crse 9"	sy	80	6.80	7.20
driveway pave 8"	sy	53	6.80	7.20

Completion time: 270 consecutive calendar days

. . . Overpass Is Underpass

The east leg of the South Route Expressway will be the Illinois Central Railroad underpass. The low bidder, Mount Vernon Bridge & Iron Co., Mt. Vernon, Ohio, will supply 4,137,325 lb of structural steel for the project for $618,530. The low was 12% under Allied Structural Steel of Chicago, second low, and 22% below Philip Zweig & Sons, Inc. of Gary, Ind, high of five bidders.

The bidding included:

1B	Mount Vernon Bridge & Iron Co., Mt. Vernon Ohio	$618,530
2	Allied Structural Steel Co., Chicago, Ill	703,345
5	Philip Zweig & Sons, Inc., Gary, Ind	796,435

Bids: 8-2-60	Unit	Quan-	Unit Prices	
Item		tity	1B	2
Steel, struct furnish	lb	4,137,325	$0.1495	$0.17

Low Pavement Prices Win Puerto Rico Airport Job

The contract to increase the apron facilities and lengthen the runway of the Puerto Rico International Airport in San Juan for jet plane operations went to Metropolitan Construction Corp. of Santurce, on a low bid of $902,965. The only stateside bidder, McDonough Const. Co. of Miami, Fla., was high at $1,677,081. Work is being performed for the Puerto Rico Ports Authority, San Juan.

The job includes paving and drainage as well as apron expansion. It will require 90,950 sq yd of 13-in. pavement, and 6,700 sq yd of 11-in. pavement in lengths 200-ft and 300-ft wide.

The winning bid was due largely to low concrete pavement prices, $7.30 per sy for 13-in. pavement, $25 per cy for 13-in. to 6-in. overlay on existing surface. Low reinforced concrete culvert pipe prices on sizes from 48-in. to 18 in. in diameter ranged from $26 to $6 per lin ft in the low bid, compared with $35 to $10 in the second bid.

The concrete is defined as Class C, five bags per cubic yard, maximum water content 6¾ gallons per bag.

Wage rates on the project are $1.00 per hour skilled, and $0.90 per hour for common labor.

The bidding included:

1C	Metropolitan Const. Corp., Santurce, P. R.	$902,965
2	Jose Benitez Gautier E Hijos, San Juan, P. R.	947,414
4	McDonough Const. Co. of Florida, Miami, Fla.	1,677,081

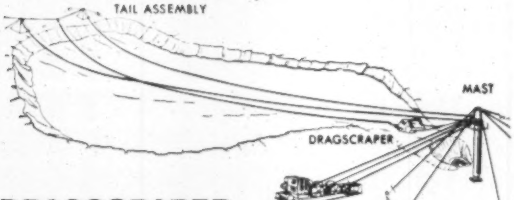
Bids: 6-3-60		Quan-	Unit Prices	
Items	Unit	tity	1C	2
Clearing & grubbing	ac	24.5	$100.00	$100.00
Exc com	cy	38,250	1.00	0.97
for runway exten	cy	5,800	1.50	0.97
Stabilized subbase	cy	1,480	3.00	2.00
Exc solid rock	cy	100	2.00	2.00
Pave, PC conc 13"	sy	90,950	7.30	7.40
variable 13" to 6" overlay on exist conc surf	cy	800	25.00	27.00
6" to 2" overlay on cleaned & etched exist conc surf	cy	235	40.00	40.00
5" to 3" overlay on cut-out sect exist conc surf	sy	2,225	5.00	8.00
11" for runway	sy	6,700	7.00	6.60
Struct PC conc incl reinf.	cy	50	60.00	50.00
RCCP Std 48"	lf	805	26.00	35.00
42"	lf	309	20.00	27.00
36"	lf	118	16.00	20.00
30"	lf	1,466	12.00	15.00
24"	lf	35	8.00	13.00
18"	lf	110	6.00	10.00
Manhole No. 25	ea	1	1,000.00	1,350.00
26	ea	1	1,500.00	1,500.00
elect	ea	6	400.00	785.00
Modify exist inlets	ea	2	150.00	100.00
Conc inlets tp A	ea	6	600.00	800.00
tp B	ea	3	1,000.00	1,000.00
tp C	ea	1	1,000.00	1,100.00
Brok conc riprap & hdwl.	cy	135	15.00	25.00
Grassing should apr	ac	4.8	1,400.00	2,500.00
runway	ac	5.1	1,400.00	2,500.00
Striping, w reflect paint 6"	lf	3,150	0.20	0.30
Duct elect conc-enc 4-way	lf	460	6.00	6.50
8-way	lf	520	12.00	12.00
12-way	lf	380	18.00	18.00
20-way	lf	5	24.00	30.00
Rem exist conc pave	sy	420	2.00	10.00
catch basins	ea	2	100.00	200.00
headwalls	ea	4	100.00	100.00
taxiway lights	ea	64	5.00	18.00

Liquidated damages: $100 per day

Cut Materials Handling Costs in Half . . .
Dig *and Haul* with a Sauerman Machine

Operating costs as low as 6¢ per ton are reported by Sauerman DragScraper and Slackline Cableway owners. This cost includes labor, power and maintenance when digging free-caving material on average haul distances.

When you use a Sauerman DragScraper or Slackline Cableway, one machine does *both* digging and hauling from deposit to plant. No double handling is required. You cut labor and equipment costs in half—or even more—because a single Sauerman Machine, controlled by one man, replaces the multiple equipment needed for other methods.

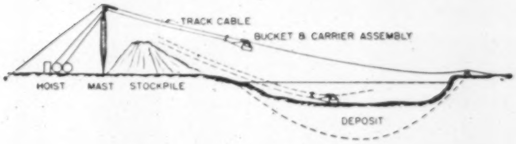


DRAGSCRAPER

DragScrapers are usually recommended for bank or pit deposits. They dig from hillsides or underwater as easily as on level ground and can haul directly to hopper or field conveyor. The Sauerman DragScraper hoist is designed for continuous duty and many years of service. The operator's control station may be remotely located for maximum visibility of deposit and plant.

DragScrapers are built in sizes from 1/3 to 15 yds. to satisfy practically all tonnage requirements.

SLACKLINE CABLEWAY



When deep digging is required or anticipated in the future, a Sauerman Slackline is usually best for the job. This powerful excavator can dig 100 ft. below water, lift its load and deliver the material to a stockpile on a 1000-ft. span.

The Slackliner Bucket inhauls at high speed and dumps automatically. Dumping point is determined by a stop button on the track cable. Gravity returns the bucket to the digging point, completing the fast operating cycle.

The use of a stockpile permits a single 2-yd. Slackline Cableway to handle the material requirements of a 200-tph. plant. Slacklines are built in sizes up to 3½ cu. yds.

★

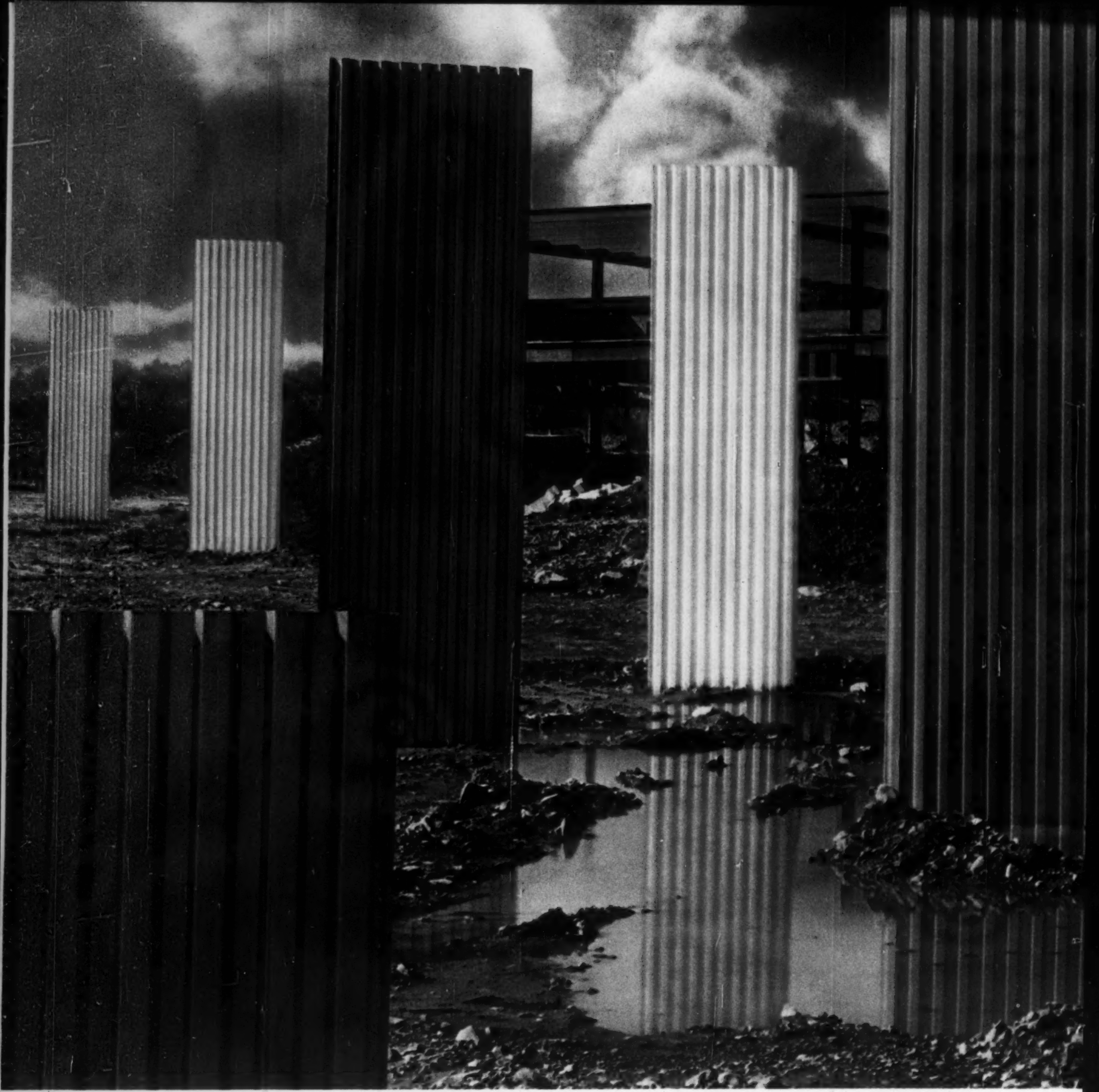
Find out how you can save with a Sauerman Machine. Write or call, giving tonnage requirements and a description of your deposit. Sauerman engineers will supply their recommendations on the most economical machine for you.

SAUERMAN BROS., INC.

632 SOUTH 28TH AVENUE • BELLWOOD, ILLINOIS
Linden 4-4892 • Cable CABEX—Bellwood, Illinois

CRESCENT DRAGSCRAPERS • SLACKLINE AND TAUTLINE CABLEWAYS • DUROLITE BLOCKS

CIRCLE 101 ON READER SERVICE CARD



Alcoa makes a lasting impression

Specify Alcoa* Alumalure finish . . . select from 11 hues or natural aluminum finish . . . get the added beauty of color, *without adding premium cost!* And let your client know that this new beauty lasts and lasts.

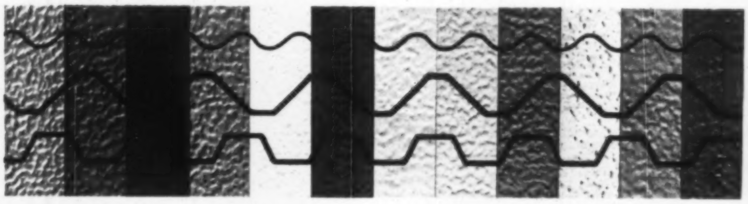
Get all the construction and long-range economies of Alcoa Aluminum. It comes in sheets as large as 48 in. wide, 30 ft long—covers more area faster. It's strong. It's light in weight, handles easier, goes up quicker. And it's corrosion resistant, so it needs *no maintenance*. Available in corrugated, V-beam, ribbed or flat sheet. Alumalure, a tough, baked enamel finish on aluminum, already has passed the *15-year* mark in a rigorous test of durability. (This is truly lasting beauty!)

Specify Alumalure finish by name . . . your assurance of the *finest* baked enamel finish, factory applied under rigid quality control. Get samples from your local Alcoa sales office. Get color swatches and full technical data by writing: Aluminum Company of America, 821-J Alcoa Building, Pittsburgh 19, Pa.

**Registered Trademarks of Aluminum Company of America*

Building site, courtesy J. M. Straus Co., General Contractor, Newark, N. J.

... and holds the line on costs



ALCOA
ALUMALURE
FINISH
MADE BY ALCOA

Specify Alumalure finish. Turn page for nearest source of supply!

you can obtain Industrial Building Products with

Alcoa Alumalure finish *and natural finish aluminum sheet through these dependable jobbers:*

ALLENTOWN
Bethlehem Aluminum, Inc.
920 Cherokee Street
Bethlehem, Pennsylvania

ATLANTA
Southern Alum. Finishing Corp.
1581 Huber St., N. W.
Atlanta, Georgia
The J. M. Tull Metal & Supply Co., Inc.
285 Marietta St., N. W.
Atlanta 3, Georgia

BIRMINGHAM
Hinkle Supply Company, Inc.
2923 Fifth Avenue, S.
Birmingham 5, Alabama

BOSTON
Edgcomb Steel of New England, Inc.
P. O. Box 437
Nashua, New Hampshire
New England Erecting Co., Inc.
321 Commonwealth Rd.
Cochituate, Massachusetts

BUFFALO
Troup Engineering Co.
295 Auburn Avenue
Buffalo 13, New York
Whitehead Metals, Inc.
2128 Elmwood Avenue
Buffalo 7, New York

CHARLOTTE
Edgcomb Steel Co.
527 Atando Avenue
Charlotte 6, North Carolina

CHICAGO
Central Steel & Wire Co.
P. O. Box 5310-A
Chicago 80, Illinois

CINCINNATI
Williams & Co., Inc.
7640 Reinhold Drive
Cincinnati 37, Ohio

CLEVELAND
Williams & Co., Inc.
3700 Perkins Avenue
Cleveland 14, Ohio

COLUMBUS
Williams & Co., Inc.
900 Williams Avenue
Columbus 12, Ohio

DALLAS
Dealers Building Materials Co.
1303 Foch Street
Ft. Worth, Texas

DAYTON
Aluminum Materials, Inc.
2663 S. Dixie Avenue
Dayton 9, Ohio

EVANSVILLE
Ohio Valley Hardware Co., Inc.
1300 Pennsylvania Expressway, W.
Evansville, Indiana

FRESNO
Healey & Popovich
1703 Fulton Street
Fresno, California

HARTFORD
H. A. Leed Co.
1685 Dixwell Avenue
Hamden, Connecticut

HOUSTON
Metal Goods Corp.
P. O. Box 1452
Houston 1, Texas

LOS ANGELES
Ducommun Metals & Supply Co.
4890 S. Alameda Street
Los Angeles 54, California
Olympic Steel Prod. Co.
3304 Temple Street
Los Angeles 26, California
George D. Widman Co.
17823 Evelyn Avenue
Gardena, California

LOUISVILLE
Perry Lumber Co.
246 Walton Avenue
Lexington, Kentucky

MEMPHIS
Arkansas Foundry
1434 E. Sixth Street
Little Rock, Arkansas

MILWAUKEE
Wisconsin Bridge and Iron
5023 N. 35th Street
Milwaukee 9, Wisconsin

NEWARK
Chris Anderson Materials Corp.
577 Sayre Avenue
Perth Amboy, New Jersey
Beers Steel Bldg. Corp.
413 High Street
Elizabeth, New Jersey

NEW YORK
Long Island Tinsmith Supply Co.
111-12 Jamaica Street
Richmond Hill 18, New York
Whitehead Metals, Inc.
303 W. 10th Street
New York 14, New York

OGDEN
Superior Engineering Sales Co.
3185 Lincoln Avenue
Ogden, Utah

PHILADELPHIA
Edgcomb Steel Co.
D Street below Erie Avenue
Philadelphia 34, Pennsylvania

PHOENIX
Ducommun Metals & Supply Co.
301 South 26th Street
Phoenix, Arizona
Garland Steel Co.
1500 S. Seventh Street
Phoenix, Arizona

PITTSBURGH
Williams & Co., Inc.
901 Pennsylvania Avenue
Pittsburgh 33, Pennsylvania

PORTLAND
Pacific Metal Co.
303 N. W. Park Avenue
Portland 9, Oregon

RICHMOND
Roof Engineering Corp.
715 Matoka Street
Norfolk, Virginia

ST. LOUIS
Mississippi Valley Structural Steel
3117 Big Bend Boulevard
St. Louis 17, Missouri

SAN DIEGO
Ducommun Metals & Supply Co.
1300 Wilson Street
San Diego, California

SAN FRANCISCO
Aluminum Prod. Hawaii, Ltd.
669 Sheridan Street
Honolulu 14, Hawaii
The Brookman Co.
2833 Third Street
San Francisco 7, California

SEATTLE
F. T. Crowe & Co., Inc.
392 Second Avenue, W.
Seattle 4, Washington

Pacific Metal Co.
4151 First Avenue, S.
Seattle, Washington

TOLEDO
Williams & Co., Inc.
946 Kane Street
Toledo 12, Ohio

YORK
Union Roofing and Paper Company, Inc.
2200 Monroe Street
York, Pennsylvania

add lasting beauty to your buildings using Industrial Building Products with Alumalure finish made by

ALCOA ALUMINUM
ALUMINUM COMPANY OF AMERICA

Work must be done at low tide on . . .

Washington, D. C. Seawall

Rebuilding and raising the concrete walk around the tip of Haine Point in East Potomac Park, Washington, D. C., a land-fill park jutting into the Potomac River and subject to occasional high water, will require that work on the seawall cap for the walk be done at low tide.

The bids break down into three parts. Base bid priced a concrete seawall cap and black steel pipe handrail. The first of two alternative bids substituted a concrete and rubble masonry seawall cap, and the second substituted galvanized iron pipe for the handrail. The Department of Interior, National Park Service, Washington, awarded the contract at $93,453 to Corson & Gruman, Washington, on a base bid of $83,126, adjusted by the addition of $10,327 for the substitution of alternate galvanized pipe for the handrail.

Work includes reconstruction of 2,100 lin ft of 7.5 ft by 6 in. thick walk, and a 2-ft deep by 2.5 ft concrete seawall cap, with a 39-in.-high three-rail railing. Concrete ramps and slabs, minor plumbing adjustments, miscellaneous drainage structures, seeding, and other related work, are also included.

All concrete work is Class BB of the D. C. Highway Department, and must contain six bags of cement per cu yd.

Minimum wages include: carpenter, $3.75; crane, derrick & power shovel operators, $3.87; concrete mixer, $3.44; laborer, $2.50.

The bidding included:

1C	Corson & Gruman, Washington	$93,453*
2	Arnold M. Diamond, Savannah, Ga	104,009*
9	Cee Bee Contractors, Washington	129,892*
EE	Div of Design & Constr., National Capital Parks	111,465*

* Base bid adjusted for alternate B

Bids: 5-31-60 Items	Unit	Quantity	Unit Prices 1C	2
Excavation, uncl	cy	2,900	$0.90	$1.25
Hard surface	cy	120	8.00	6.00
Tree removal	ls	job	125.00	600.00
Earth fill	cy	8,300	1.45	2.25
Gravel, bank run	cy	210	4.60	4.50
washed	cy	340	5.40	6.50
Concrete ramp	ea	2	166.00	140.00
Crane pad	ea	5	280.00	200.00
Conc paving, 4" thick	sy	40	5.60	6.50
6" thick	sy	1,750	7.65	8.50
Pervious fill	cy	800	3.15	6.50
Conc seawall cap	cy	470	53.00	52.00
pipe, 4"φ	lf	123	6.00	3.00
Drinking fountain, replace	ls	job	150.00	325.00
Sprinkler box, adjust	ea	2	50.00	125.00
Catchbasin, remove	ls	job	50.00	100.00
Handrail (black stl pipe)	lf	2,110	6.77	7.50
Seeding & mulching	sy	17,100	0.38	0.35
Alternate 1				
Rubble masonry seawall	cy	210	95.00	70.00
oncrete seawall cap C	cy	260	55.00	60.00
Alternate 2				
Substitute GI pipe for black steel pipe railing	lf	2,100	11.72	11.50

Commence: About 7-15-60 Complete: 120 cal days
Liq. dam.: $25/day

Bidding Tight on Feather River Tunnel

Close bidding for Tunnel 1, on the Western Pacific Railroad relocation around Oroville Reservoir in Butte County, Calif., took the $2,069,090 contract for Frazier-Davis Construction Co. of St. Louis by a margin of less than 0.8% below the bid entered by the Grafe-Callahan Construction Co. of Los Angeles. It was 21% under high bid by Morrison-Knudsen Co. Inc. of Los Angeles.

The tunnel, part of the Feather River project, will be concrete lined, 2,750 ft long, 18 ft wide, 24 ft high from top of rail, and will have a 9-ft radius crown. It is on a 4-deg, 30-in. curve completely lined.

Basic wage rates without fringe benefits for Tunnel 1 are: general labor, $3.045/hr; carpenters, $3.63/hr; $3.79 for tractor operators; $3.595 for tunnel miners; reinforcing iron workers, $3.825; and $3.445 for steel form raiser and setter.

The bidding included:

1C	Frazier-Davis Constr. Co., St. Louis, Mo.	$2,069,090
2	Grafe-Callahan Constr. Co., Los Angeles	2,085,501
7	Morrison-Knudsen Co., Inc., Los Angeles	2,603,085

Items—Bids: 6-22-60	Unit	Quantity	Unit Prices 1C	2
Clearing and grubbing	acre	12	$100.00	$1,088
Excav, rdwy	cy	90,000	1.25	1.50
struct	cy	5,000	5.00	12.14
ditch & channel	cy	500	5.00	3.10
Backfill, struct	cy	3,200	3.00	2.07
Excav, tunnel	cy	54,000	13.50	13.62
Leveling course	cy	500	10.00	8.30
Riprap	cy	70	15.00	6.00
Conc, structures	cy	900	43.00	80.00
tunnel invert	cy	1,050	20.00	14.50
tunnel lining	cy	14,200	28.00	24.30
grout for riprap	cy	15	20.00	28.00
Cement	bbl	29,000	5.00	4.25
Steel, reinf bars	lb	1,500,000	0.12	0.115
perm struct supports	lb	1,000,000	0.25	0.25
Bolts, rock	lf	13,000	1.75	1.75
Chain-link fabric	sf	30,000	0.20	0.20
Timber	Mbf	240	250.00	250.00
Misc metalwork	lb	1,900	0.50	0.60
Guard rail, metal beam	lf	120	7.00	2.30
Paved invert, asb bnded				
CMP, 12 ga, 18"φ	lf	120	10.00	9.00
10 ga, 42"	lf	100	25.00	25.00
8 ga, 42"	lf	320	30.00	28.00
Elbows, 8 ga, 42"	ea	2	400.00	400.00
Paved invert, bit coatd				
CMP multi pl 10 ga 66"	lf	170	50.00	50.00
Elbows, 7 ga 66"	ea	2	600.00	550.00
RCP, 72" φ	lf	160	65.00	40.00
Perf MP asb bnd 16 ga 8"	lf	20	5.00	3.00
Fence, r-o-w	lf	2,000	1.00	0.75
Electrical installation	ls	.....	23,800	29,000

Completion schedule, 400 calendar days
Liquidated damages, $150 per day

In the field of

HYDRAULIC DREDGING

GAHAGAN

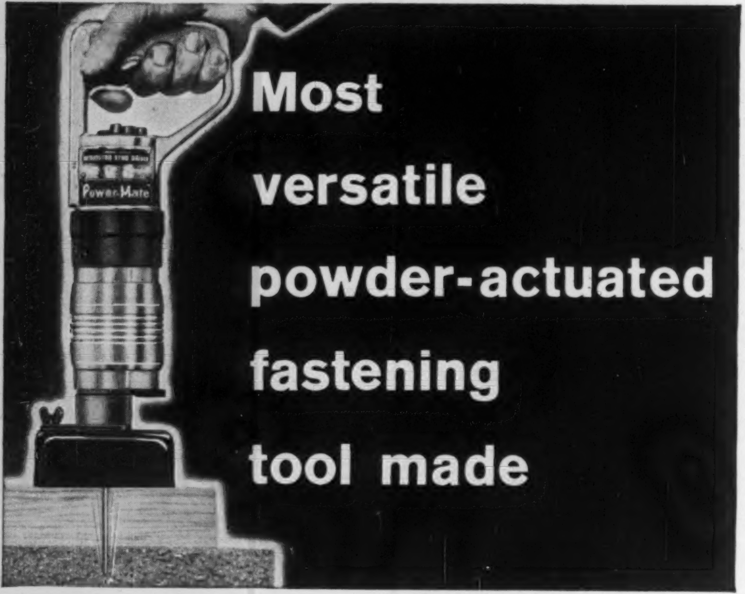
a leading name for over 50 years

Gahagan Dredging Corporation,
90 Broad St., New York 4, N. Y.
Write, wire or phone Whitehall 3-2558. Cable "Walgahagan".

Next time get
LESCHEN
Wire Rope

LESCHEN WIRE PORTER ROPE DIVISION
H. K. PORTER COMPANY, INC.

Remington Stud Driver



The basic Power Unit...

Here's the single basic tool that gives you a new degree of on-the-job fastening versatility. Only *one* basic unit to buy—the Remington Model 455A—for all your fastening applications. Just choose the instantly interchangeable fastening attachment you need to do the job!

Plus choice of 4 fastening attachments...

K-1 1/4" & 3/8" Light-Duty Captive Stud Attachment uses 22 cal. Power Loads. Use where extra safety is needed.

K-2 1/4" Light-Duty Attachment uses 22 cal. Power Loads. Handles 80% of your fastening jobs.

K-3 3/8" Medium-Duty Attachment drives heavy-duty studs with inexpensive 22 cal. Power Loads.

K-4 3/8" Medium and Heavy-Duty Attachment. Uses both 22 and 32 cal. Power Loads. For toughest jobs.

offers greatest single-tool fastening versatility!

The Remington Stud Driver offers these exclusive features:

- Four fastening attachments for light, medium, heavy-duty work, including the special Captive Stud Attachment for extra-safe fastening. No other single tool can cover such a variety of applications.
- Medium-duty fastening—requiring ⅜" studs—can be done with low-cost 22 caliber Power Loads.
- Positive one or two-hand operation at operator's option . . . no buttons or release to hold while fastening.
- Greater variety of applications made possible with instantly interchangeable guards. These 4" square, hollow "safety guards" fit snugly over work, trap spall and dust. More than 40 types are available.

Send coupon for free booklet about the Remington Stud Driver—your best buy in powder-actuated fastening tools!

Remington

DU PONT

Remington Arms Company, Inc., Bridgeport 2, Conn.
IN CANADA: Remington Arms of Canada Limited,
36 Queen Elizabeth Blvd., Toronto 18, Ont.

—FREE POWER TOOL CATALOGS—

Remington Arms Company, Inc., Bridgeport 2, Conn. ENR-9
Please send—without obligation—information on Remington Contractor & Industrial Equipment checked below:

☐ Stud Drivers ☐ Air Tools ☐ Chain Saws
☐ Concrete Vibrators ☐ Flexible Shaft Machines

Name ________ *Position* ________
Company ________
Address ________
City ________ *Zone* ____ *State* ________

Prestressed Pile Bents For Florida Deck Bridge

The Naranja Rock Co.'s low bid of $235,343 took the contract to build a 7.068-mile highway for the Florida State Highway Department in Hendry County.

Naranja's figure was $11,635 below Harper Brothers of Ft. Myers, and $32,928 under the Hardrive Co., high of nine bidders.

The road extends from the Hendry and Lee county line to a point approximately 1½ miles west of La Belle, in Hendry County. The number of the new roadway will be state route S 78. Hendry County is located in southern Florida, between Lee County on the Gulf Coast and Palm Beach County on the east.

Work includes medium grading, type 2 surface treatment, and a 6½-in. lime rock base. A 132.5-ft bridge with a concrete slab deck constructed on prestressed concrete pile bents will be included as part of the project as well as three concrete box culverts and small drainage structures.

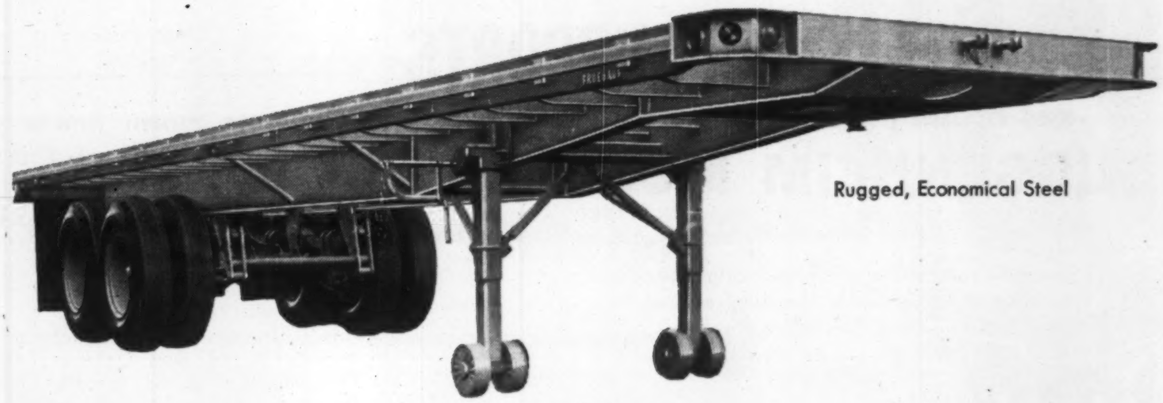
State minimum wage rates set by the state in this area are: common labor, $1.25/hr; carpenters and mechanics, $2.00/hr; oilers, $1.67½; $2.50 for crane operators; $1.75/hr for bulldozer operators; and $1.25 for truckdrivers.

The bidding included:

1C	Naranja Rock Co., Naranja, Fla	$235,343
2	Harper Brothers, Inc., Ft. Meyers, Fla	246,978
9	Hardrives Co., Inc., Ft. Lauderdale, Fla	268,271

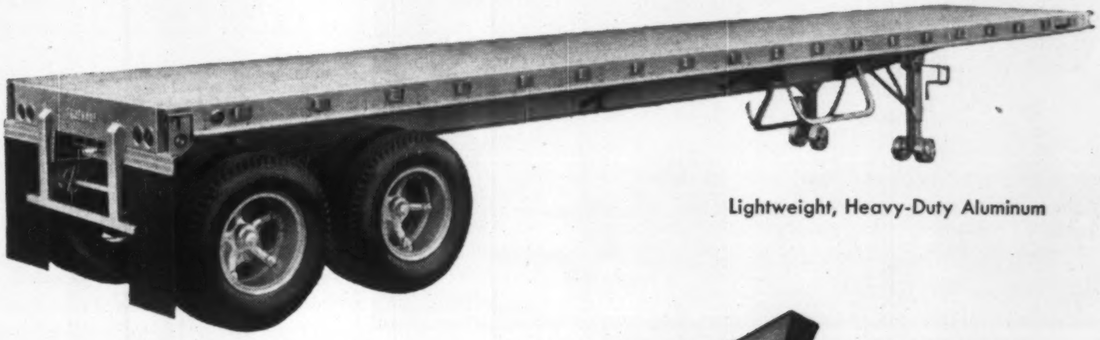
Items — Bids:6-28-60	Unit	Quantity	Unit Prices 1 C	Unit Prices 2
Maintain traffic, A	ls	1	$5,000	$1,000
B	ls	1	200.00	4,000
Clear & grub A	ls	1	10,654	10,654
B	ls	1	100	100
Grading	rdmi	7.068	1,200	1,600
Excav, borrow	cy	71,605	0.30	0.36
subsoil	cy	2,783	0.50	0.30
Stabilizing A	ls	1	7,112	10,000
B	ls	1	100	1,000
Limerock base	sy	84,536	0.75	0.80
Conc, approach slabs	ea	2	1,100	900.00
Cover matl for st	cy	2,317	7.00	7.50
Bit matl st/ac 150-200 pen	gal	41,422	0.17	0.17
5A	gal	49,876		
Conc, clA, br & culv	cy	642.96	62.00	60.00
handrail	lf	265	6.00	5.50
cl NS endwall	cy	82.4	65.00	65.00
Steel, reinf	lb	95,212	0.12	0.12
Culvert CP 18" SD alt	lf	648	no bid	no bid
24" SD alt	lf	75	no bid	no bid
30" SD alt	lf	72	no bid	no bid
24" CD	lf	205	7.25	6.80
30" CD	lf	47	9.50	10.50
36" CD	lf	316	13.80	14.00
42" CD	lf	50	16.50	16.00
CMP 18" SD	lf	648	4.00	4.00
24" SD	lf	75	6.20	6.50
30" SD	lf	72	7.00	8.00
Piling, precst conc, 14" prestressed, furn	lf	1,000	4.25	4.25
drive	lf	1,000	3.25	2.00
Piles unl test, 14" prestr	lf	85	18.00	20.00
Test load	ea	1	100.00	75.00
Punching, per pile	ea	13	50.00	27.00
Conc, ditch pave, 3"	sy	262	4.50	6.00
Riprap, sand-cmt	cy	75	35.00	35.00
Guardrail	lf	950	3.25	3.35
Markers, R/W install	ea	104	5.00	2.00
proj, complete	ea	2	30.00	10.00
Grassing & mulching	sy	130,045	0.024	0.03
Mulch matl	t	81	33.00	35.00

Completion time: 290 calendar days



Rugged, Economical Steel

TWO POWERFUL NEW LIGHTWEIGHT FRUEHAUF WORKHORSE PLATFORMS!



Lightweight, Heavy-Duty Aluminum

New ruggedness . . . New weight savings . . . New features . . . New interchangeability of steel and aluminum components—both crossmembers and side rails . . . Deep steel main members, deepest where the load is greatest . . One-piece I-beam crossmembers fitting *through* the main frame—Integral rubrail . . . Recessed, protected lights of a new, impact-resistant design . . . New, lightweight, self-lubricating Square Leg 2-speed supports . . . Heavy duty aluminum or hardwood floors . . . Tapered stake pockets . . . Optional, independently removable aluminum racks with steel posts . . . Wide choice of economical, maintenance-free suspensions . . . The lightest weight platforms for their strength ever built!

FRUEHAUF TRAILERS

For Forty-Six Years—World's Largest Builder Of Truck-Trailers!

FRUEHAUF TRAILER COMPANY
10949 Harper Avenue • Detroit 32, Michigan

SEND THE FULL STORY ON THE AMAZINGLY STRONG, AMAZINGLY LIGHTWEIGHT NEW WORKHORSE PLATFORMS!

Name______________________________
(Please Print)

Company____________________________

Address____________________________

City________________State__________

SYLGAB BAR SUPPORTS

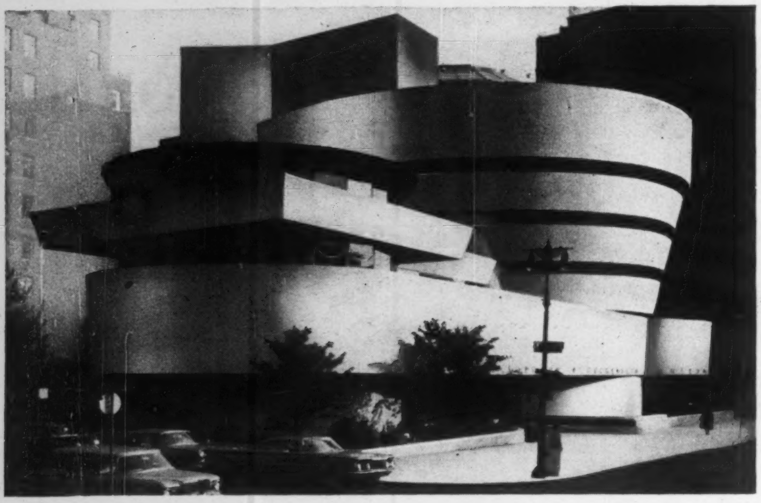
used exclusively in the new

GUGGENHEIM MUSEUM

Frank Lloyd Wright, ARCHITECT
Euclid Contracting Corp., New York City, BUILDERS

Structural complexities of the much-discussed design, built entirely of reinforced concrete, required exceptional suppliers. Sylgab's range and flexibility of product provided these facilities.

SYLGAB bar supports for concrete construction of the museum were selected by the builders because of SYLGAB'S reputation for delivering "the right material at the right time."



SYLGAB products offer two major time-saving advantages: they are designed for instant installation; they permit fast pouring due to high rigidity. In addition, our service assures delivery exactly when required.

SYLGAB
STEEL & WIRE CORP.

Phone, Write or Wire
For
SYLGAB CATALOG
your most reliable guide to Reinforced Concrete Accessories

Member Concrete
Reinforcing Institute

SYLGAB
STEEL & WIRE CORP.
79-05 Cooper Ave.,
BROOKLYN 27, N. Y.

BEAM CLIPS • SPECIAL COLUMN CLIPS
EXPANSIBLE CLIPS
STRAIGHT AND COIL WIRE
HAIRPIN CLIPS • TOGGLE HANGERS
FORM SPACERS • BAR ACCESSORIES

Minnesota Storm Sewer Priced by Depth of Cut

The Montgomery Construction Co., the only out of state bidder, won this New Hope, Minn. storm sewer contract with a low bid of $116,484,62, 7% below the estimate, and 5% below the second lowest bidder.

The Montgomery Co. was below the second low bid, Bart Carlone of St. Paul, Minn., in its unit prices for reinforced concrete pipe in diameters of 10 in. to 21 in., but above by as much as $2.40 in the 24-in. to 36-in. range.

The sewer project will take 13,428 lin ft of pipe, ranging from 10 in. to 36 in. in diameter, and two outlet boxes will be used.

The contract starting date was June 20, 1960; the completion date for the project is October 15, 1960.

Wage rates on the storm sewer job are: Skilled labor, $3.67 per hour; semi-skilled, $3.10; and common, $2.80.

The bidding included:

1C	Montgomery Constr. Co., Montgomery, Ala.	$116,485
2	Bart Carlone, St. Paul, Minn.	122,696
4	Peter Lametti Constr. Co., St. Paul, Minn.	135,244
EE	Bonestroo & Assoc., St. Paul, Minn.	125,000

Bids: 6-6-60 Items in place		Depth	Unit	Quantity	Unit Prices 1C	 2
RCP ES C14	10"ϕ	0-6'	lf	1,728	$2.74	$3.90
RCP C3	12"	0-6'	lf	1,498	4.10	4.60
	12"	6-8'	lf	224	4.30	4.80
	12"	8-10'	lf	10	4.70	5.30
	15"	0-6'	lf	2,240	4.60	4.90
	15"	6-8'	lf	28	4.80	5.25
	15"	8-10'	lf	115	5.30	5.80
	18"	0-6'	lf	1,500	5.40	6.00
	18"	6-8'	lf	30	5.50	6.40
	21"	0-6'	lf	935	6.40	6.95
	21"	6-8'	lf	534	6.60	7.20
	21"	8-10'	lf	295	7.30	7.70
	21"	10-12'	lf	270	8.20	8.90
C4	21"	12-14'	lf	225	10.00	9.80
	21"	14-16'	lf	360	11.00	11.50
	21"	16-18'	lf	85	13.00	13.70
C3	24"	0-6'	lf	150	7.55	7.30
	24"	6-8'	lf	170	8.30	7.60
	27"	0-6'	lf	20	9.20	8.30
	27"	6-8'	lf	90	9.60	8.95
	27"	8-10'	lf	155	10.30	9.90
	27"	10-12'	lf	180	11.50	10.50
	27"	12-14'	lf	420	12.50	11.80
	30"	0-6'	lf	573	10.20	10.00
	30"	6-8'	lf	206	11.00	11.00
	33"	0-6'	lf	75	12.00	11.70
	33"	6-8'	lf	10	13.00	12.30
	33"	8-10'	lf	59	15.00	13.00
	33"	10-12'	lf	125	16.00	13.80
	33"	12-14'	lf	230	17.00	14.60
	36"	0-6'	lf	12	13.50	13.50
	36"	6-8'	lf	55	14.50	14.00
	36"	8-10'	lf	710	15.50	14.75
RCP flared end sect	15"		ea	3	70.00	55.00
	18"		ea	3	80.00	60.00
RCP 7½° short bend						
	21"	6-8'	ea	1	20.00	25.00
	21"	8-10'	ea	1	25.00	28.00
	21"	10-12'	ea	1	30.00	32.00
	21"	12-14'	ea	1	40.00	35.00
	30"	0-6'	ea	3	30.00	30.00
	33"	10-12'	ea	1	40.00	75.00
long bend	15"	0-6'	ea	4	40.00	30.00
	33"	8-10'	ea	10	85.00	80.00
	36"	0-6'	ea	4	95.00	85.00
	36"	6-8'	ea	2	95.00	88.00
	36"	8-10'	ea	8	100.00	90.00
Outlet box #1			ea	1	500.00	450.00
Outlet box #2			ea	1	500.00	450.00
Std MH, 8' deep with casting			ea	34	210.00	250.00
8' deep with CB casting			ea	8	240.00	290.00
MH depth greater than 8'			lf	33	20.00	23.00
less than 8'			lf	108	1.00	10.00
Std CB with casting			ea	66	135.00	165.00
with R-4340-A casting			ea	2	150.00	150.00
21"x12" wye branch			ea	1	50.00	25.00
Cl 8 gravel stabilization			t	150	5.00	7.00

Question for crane and excavator owners:

Is torque converter drive "better" or only "different"?

When you buy an engine, you're actually buying "horsepower." To deliver the horsepower you paid for, the engine has to operate at or near its governed speed. Every time the engine lugs down under load, it's like money out of your pocket, because you're being *robbed* of horsepower.

In excavator work, particularly in back-hoe and shovel digging, the operator works more or less "by ear," depending on engine noise to find the best bite. This requires careful crowd control to keep from killing the engine. The deeper the bite, the more the engine lugs—with a sacrifice of digging power. The fixed gear ratio in a mechanical shovel drive cannot prevent this power loss.

Keeping this fact in mind, let's take a look at a shovel operation using straight mechanical drive. As the shovel bites in, the load reduces machinery rpm and the engine lugs down. So the operator moves his crowd control trying to find a better bite that will let the engine regain its governed speed. By now, input torque may have already dropped along with rpms. So again the engine lugs as it shoulders the new load—setting up shocks and vibrations throughout the drive train, as well as giving the operator a "workout" which may be repeated hundreds of times a day. From a dollars-and-cents point of view, it's plain inefficient.

Cut-Depth Guesswork Gone

Now let's take the same job and put a torque converter behind the engine. As before, when the cut gets deep, the dipper will slow down, but the engine does *not* lug down. The dipper becomes filled in a shorter distance at little or no increase in filling time. The operator can dig deeper faster because he uses the horsepower advantage gained from an engine running at near constant speed, delivering more horsepower—through the torque converter—to the deck machinery.

It's all done automatically by the torque converter's unique ability to increase engine torque output in the exact ratio demanded by the load. By eliminating engine lugging, the converter gets more work done faster.

"Force without motion" is another advantage of torque converter drive. In crane erection work, any size load can be lifted "on the throttle" and held in mid-air without swaying. This ability to inch and hold under power makes for safety and accuracy in spotting.

Where Did the "Snap" Go?

Ever hear an operator complain that a converter-equipped machine lacked "snap"? He's right as rain, but it's no cause for complaint. The "snap" he's accustomed to is the impact energy caused by quick drum speed change, a common occurrence with mechanical drive. Any sudden load increase imposes terrific shocks on the power train as moving parts are caught in an unyielding steel-clad grip. The resulting stress may be *ten* times that of normal operation. Most machinery downtime can be directly traced to these shock loads.

In a torque converter there's no metal-to-metal connection between driving and driven equipment. The hydraulic fluid has the magic power to soak up shocks and jolts . . . they cannot pass through the converter, either from engine to deck machinery or vice versa. Cable life is doubled and often tripled as a result of this smooth output power.

Profit is the Pay-off

Torque converters pay off across the board. They increase machine average power loading as well as work output per hour. They eliminate the shock loads that lead to high maintenance costs. And they're a real time and equipment saver when it comes to training new operators.

If you're planning to purchase a new machine or repower an old one, torque converter drive will guarantee a bigger return on your investment dollar. Ask your dealer for a demonstration, and be sure to specify Twin Disc — first and foremost name in torque converters. Twin Disc Converters — single-stage or three-stage from 30 to 1000 horsepower — are standard or optional equipment on every make of crane and shovel.

TWIN DISC
POWER TRANSMISSION EQUIPMENT

TWIN DISC
Torque Converters

TWIN DISC CLUTCH COMPANY
RACINE, WISCONSIN
HYDRAULIC DIVISION, Rockford, Illinois

"Each welded truss weighed 1,000 pounds less than the same truss riveted."

Welded Construction with The SAXE SEAT & CLIP

Saves **TIME • MONEY • STEEL** and Produces **BETTER BUILDINGS**

SEND FOR FREE DATA

SAXE WELDED CONNECTIONS
1701 ST. PAUL STREET • BALTIMORE 2, MARYLAND

SUSTAINING MEMBER AMERICAN WELDING SOCIETY

☐ Send me a copy of the new 1960 edition of the **SAXE MANUAL FOR STRUCTURAL WELDING PRACTICE,** as applied to Saxe Welded Connection Units for Welded Assembly.

Name________________ Title________

Company________________

Street________________

City________________ Zone______ State________

Concrete, 32% of Seattle Underpass Cost

Ostruske-Murphy, Inc. of Tacoma will build 800 ft of Seattle subway with approaches under the new airport extension for $1,423,402. The low is $41,402 over the engineer's estimate, but $16,209 under the second bid by Peter Kiewit Sons Co. It's $251,522 below S. S. Mullen, the high of nine bidders. Cecil C. Arnold, Seattle, is the consulting engineer.

Concrete costs showed sizeable differences between bids. For example, 9,103 cy of Class A concrete for subway walls and roof ranged from the Ostruske-Murphy bid of $33.62/cy to $54.93/cy. Prices for 3,972 cy of Class B for foundation and walls jumped from a low of $34.24/cy to the high of $81.82/cy.

The four reinforced concrete lanes are separated into eastbound and westbound lanes by a 1-ft 6-in.-thick wall. The outerwalls are 2 ft thick, and the entire underpass is 72 ft 6 in. wide, including outerwalls. The project is a continuation of the S 188th St. line, and part of the 1960 Seattle-Tacoma Airport Development Program.

Prevailing wage rates in the Seattle area include: common labor, $3.00 per hour; carpenters, $3.38 plus $0.20/hr fringe benefit; $3.76/hr plus $0.10 for structural iron workers; electrical workers, $3.95 plus $0.27/hr fringe.

The bidding included:

1C	Ostruske-Murphy Inc. Tacoma, Wash.	$1,423,402
2	Peter Kiewit Sons Co. Vancouver, Wash	1,439,611
9	S. S. Mullen Inc. Seattle, Wash	1,674,924
EE	Cecil C. Arnold, Seattle, Wash	1,382,000

Bids: 6-14-60 Items	Unit	Quantity	Unit Prices 1C	 2
Exc, uncl & borrow	cy	1,000	$1.00	1.00
Subgrade compact	ls	job	1,000	1,500
Inlets, cast metal	ea	10	90.00	100.00
Manholes	ea	10	120.00	100.00
Catch basins	ea	4	240.00	85.00
Borrow, sel rdwy	t	18,000	1.50	1.50
Crushed surface	t	2,200	4.50	3.50
Asph cem pri coat	t	25	50.00	52.00
Aggregate pri coat	cy	160	5.00	5.25
Asph conc pave A	t	3,100	7.80	8.25
Conc curb & gutter	lf	7,000	1.90	1.90
Trf curb, prec tp A	lf	312	2.00	2.50
Prec trf buttons	ea	20	3.00	3.00
Exc, subw structure	cy	4,000	3.00	3.30
Subw, walls & rf cl A concrete	ls	job	306,000	332,000
fdn & walls cl B concrete	ls	job	136,000	137,000
Walls, port clB conc	cy	370	50.00	40.00
prec facing portl & parapet	ls	job	9,300	14,000
Steel, reinf bars	lb	3,078,500	0.115	0.1225
Fire doors, metal	ea	4	400.00	200.00
Wlkw rail, metal	ls	job	16,000	24,000
Paint subw walls & ceiling	ls	job	16,000	7,300
House, gen & trans	ls	job	6,600	6,000
Vent system	ls	job	330,000	293,000
Elect system	ls	job	114,000	118,000
Emergency communicat system facilities	ls	job	1,200	1,000
Generator, aux f&i	ls	job	4,000	4,000
Hyds, WM & fire f&i	ls	job	16,000	16,000

Completion time; 290 calendar days

Can you use some fine bridge construction films?

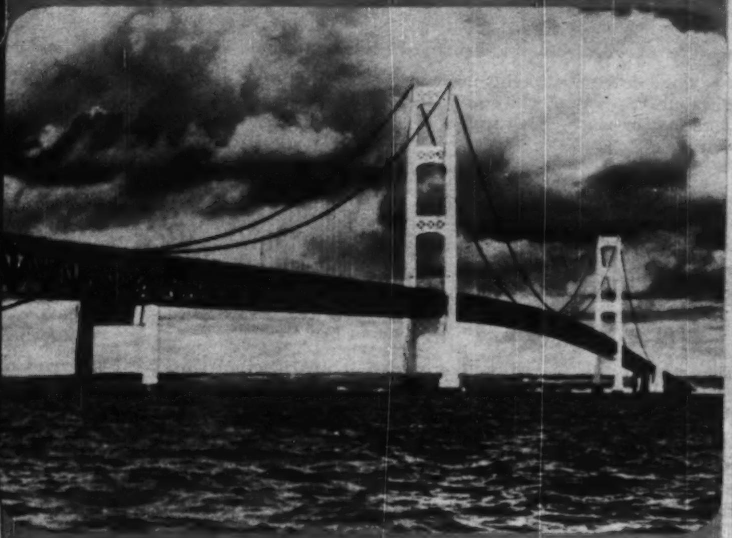
American Bridge has documented on film two of the greatest bridge stories of modern times: **Mackinac Bridge Diary** is a 27-minute color film that tells how one of the world's greatest bridges was built. **Challenge at Carquinez** tells how the first major shop-welded bridge was designed and erected over Carquinez Strait in California.

American Bridge also has produced explanatory films on **The Suspension Bridge, The Cantilever Bridge, The Arch Bridge,** and a brand new film on **Movable Bridges.** You'll find that all of these films are perfect for classroom, club or conference use. To order your free films, fill in the coupon below.

USS is a registered trademark

USS

American Bridge
Division of
United States Steel



American Bridge Division, United States Steel Corporation
Room 1831, 525 William Penn Place, Pittsburgh 30, Pa.

Title	Desired Date	Alternate Date
☐ Mackinac Bridge Diary—16mm Color Film, 27 minutes		
☐ Challenge at Carquinez—16mm Color Film, 27 minutes		
☐ The Suspension Bridge—16mm Color Film, 26 minutes		
☐ The Cantilever Bridge—16mm Color Film, 25 minutes		
☐ The Arch Bridge—16mm Color Film, 29½ minutes		
☐ Movable Bridges—16mm Color Film, 28 minutes		

To Be Shown To____________________

Ship Film To:

Name____________________

Firm or School____________________

Address____________________

City__________ Zone_____ State________

Quickly, easily Steeltex goes down at superbly designed Canevin High School, Pittsburgh, where 60,000 square feet of Steeltex support concrete floor slabs. Architect: Celli-Flynn, McKeesport, Pa. Contractor: Navarro Corp., Pittsburgh. Steeltex from Pittsburgh Steel Co. was specially commended for its installation features on this project.

Architect, Contractor Find . . .

Steeltex Saves 35 Cents per Square Foot

"I estimate we saved about 35 cents per square foot by using Steeltex instead of another material on the Baptist Hospital addition in Pensacola. Steeltex' quick installation also helped us meet our construction timetable easily."

Man speaking: President Raymond C. Dyson of Dyson and Company, Pensacola, Fla., general contractors.

Job: $1¾-million addition to Baptist Hospital. Here, Pittsburgh Steel Company supplied 70,000 square feet of Steeltex, the waterproofed, paper-backed wire mesh reinforcing used in the concrete floors and roof slabs.

Like Mr. Dyson, Architect Charles H. McCauley has used Steeltex for more than 20 years. He, too, knows Steeltex helps provide better construction at lower costs.

"I specified 100,000 square feet of Steeltex when the main hospital building was erected eight years ago," said Mr. McCauley. "Naturally, I specified it again when the addition was built. I think this shows I am enthusiastic about the qualities of Steeltex."

- **Cost 30-40 Percent Less**—Similar comments came from Cleveland where Architect Eugene W. Gray and Contractor William Passalacqua were responsible for constructing the new $600,000 Child Welfare Division Building.

Mr. Gray and O. E. Kronenwetter, chief engineer for Passalacqua Builders, estimated that 30,000 square feet of Steeltex in floor slabs cost 30 to 40 percent less than methods generally specified.

- **On Pittsburgh Job**—When Steeltex was combined with Pittsburgh Steel's wire mesh to support 60,000 square feet of concrete floor slabs at Canevin High School in Pittsburgh, Steeltex was specially commended for its installation features.

Joseph V. Cutuly, job superintendent for the general contractor, Navarro Corporation of Pittsburgh, likes Steeltex because "it takes more punishment during installation than a sheet metal, goes down faster and is much easier to handle."

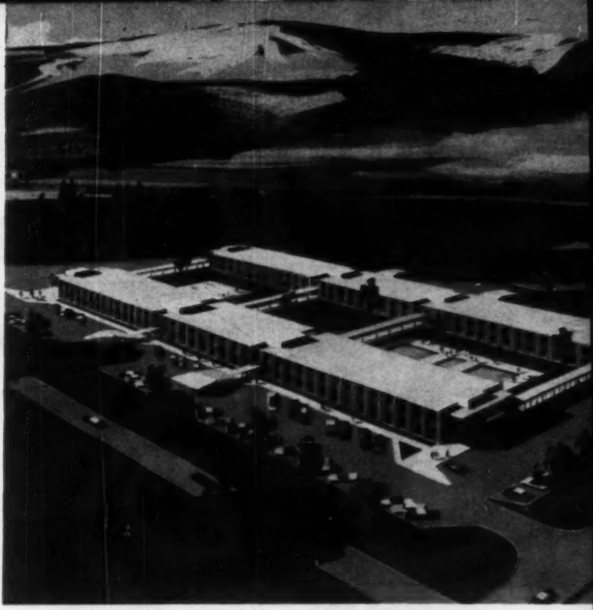
Dean Regan, foreman of the crew that installed Steeltex in the $2½-million building, has used Steeltex on more than 55 jobs in ten years.

"Steeltex is very easy to install. Just unroll it, cut, tighten and clip," he said.

- **Makes Stronger Slab**—William B. Tabler of New York City, architect for the $2½-million Hilton Inn at the San Francisco Airport where 65,000 square feet of Steeltex supports the floors, pointed out additional Steeltex features. Said Mr. Tabler:

"Steeltex retains moisture and cement to a greater degree than lath. This makes a cleaner job. Also, the sag from the concrete cradled in the Steeltex gives additional lateral resistance which aids earthquake construction."

Snug fit of Steeltex around drain pipe at Canevin High School is shown by Joseph V. Cutuly, job superintendent (l.), and Foreman Dean Regan. Mr. Cutuly says, "Steeltex takes more punishment during installation than a sheet material, goes down faster and is much easier to handle."



At luxurious Hilton Inn, San Francisco Airport, 65,000 square feet of Steeltex in floor slabs aid earthquake construction. Architect: William B. Tabler, New York City. Contractor: Cahill Construction Co., San Francisco.

- **New Users Like Steeltex**—Steeltex also is endorsed by new users such as the architectural firm of Charles Bacon Rowley and Associates, Inc., and Ernst Payer, and Contractor Albert M. Higley Company, both of Cleveland. They teamed up on building the $805,000 Western Reserve Historical Society Museum in their city.

Superintendent Albert M. Higley Jr. estimated "perhaps a four percent savings was realized by using 11,500 square feet of Steeltex instead of placing conventional roof structures."

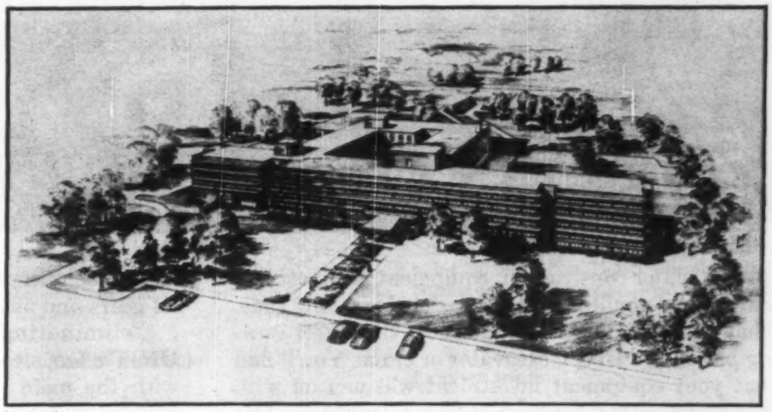
- **Will Use Again**—Another satisfied new user is Irving D. Robinson, architect for the new $325,000 Luria Brothers Building in Cleveland.

Mr. Robinson said: "This is the first time I specified Steeltex and I am sure I will use it many times again. Steeltex permitted work to continue on the floors without planking or scaffolding, although the concrete slab was not poured for many weeks after the 12,000 square feet of Steeltex were installed." Contractor for the job was J. L. Hunting Company, Cleveland.

Whether you are a veteran Steeltex user or a newcomer, you cannot afford to pass up using Steeltex on your next construction job.

Trained sales engineers are available to help solve your construction problems. Put them and Steeltex to work for you soon.

Contact the nearest Pittsburgh Steel Products sales office listed at right. Call today . . . you'll be glad you did.



$24,500 was saved on cost of material and labor by using 70,000 square feet of Steeltex in the Baptist Hospital addition in Pensacola. Architect: Charles H. McCauley, Birmingham. Contractor: Dyson and Company, Pensacola.

▶ See Sweets Catalog Section 2-A

Steeltex®

Pittsburgh Steel Company

Grant Building • Pittsburgh 30, Pa.

DISTRICT SALES OFFICES

Atlanta	Cleveland	Detroit	Los Angeles	Pittsburgh
Chicago	Dayton	Houston	New York	Tulsa
			Philadelphia	Warren, Ohio

CIRCLE 113 ON READER SERVICE CARD

You and UNIT earning power

. . . a payload partnership
UNIT
JFL TRUCKING EXCAVATING
UNIT

Completely satisfied with the performance record of his two UNIT ¾ YD. excavators, Mr. James Lavin of JFL Trucking and Excavating, West Allis, Wis., says he'll pick UNIT again when buying a new machine.

Buying major construction equipment is almost like marriage — you'll live with your choice a long time. That's why it's important to choose the bigger *earning power* of a UNIT excavator or crane. You'll find that your equipment investment will pay off with fast cycle speeds, big output and more dependable performance than other machines in the same size range. You and your UNIT will have a true *payload partnership.*

Fast work on the job — lowest operating cost — negligible downtime . . . these are but some of the reasons why the *earning power* of a UNIT lets you knock out the competition at bid letting time. You win more contracts with a combination of job-proved features, finest quality components and unmatched workmanship.

Features like UNIT'S exclusive one-piece cast main machinery gear case that completely encloses all gears and shafts in a constant bath of lubricant . . . eliminating frequent adjusting or greasing. UNIT offers straight-in-line mounting of the engine with the main machinery to give longer machine life and perfect alignment of all working parts. All disc-type operating clutches are interchangeable . . . can't grab or self-energize. The exclusive automatic traction brakes on crawler machines assure positive, safe braking power . . . even on the steepest grades. Long, wide-spread crawlers and a big, heavy carbody provide the solid working base you need to get full dippers in the toughest material.

You can start on the road to your *payload partnership* right now by calling your UNIT dealer. He's got the detailed information you need on the 5 UNIT convertible crawler machines, 4 UNIT convertible truck cranes and 2 UNIT mobile cranes.

SHOVELS	HOES	CRANES	DRAGLINES
½ to ¾ YDS.	½ to ¾ YDS.	5½ to 40 TONS	½ to ¾ YDS.

UNIT

UNIT CRANE & SHOVEL CORP.

6315 W. Burnham Street
Milwaukee 19, Wisconsin

CIRCLE 114 ON READER SERVICE CARD

Publications

Want More Information on Equipment, Materials?

Use ENR's inquiry card to order the publications you want all at once. The card is on page 137.

Construction Equipment

Asphalt plants

A heavily illustrated 104-page catalog carries descriptions and specifications of mobile and stationary asphalt plants, stabilization plants, aggregate dryers and feeders. Hetherington & Berner Inc. **301**

Asphalt plants

Portable, semi-portable and stationary asphalt plants ranging in capacities from 2,000 to 8,000 lb are the subject of a large folder. Standard Steel Corp. **302**

Concrete plant

Three transit-mix concrete plants with bin capacities ranging from 55 cu yd to 105 cu yd are described in a six-page folder. C. S. Johnson Co. **303**

Gravel plant

Photographs of components and specifications of a heavy duty gravel plant are in a six-page folder. Universal Engineering Corporation. **304**

Stiffleg derricks

A four-page brochure about a line of stiffleg derricks includes a table showing capacities of the different models at various radii. Joe Stine, Inc. **305**

Crawler-mounted shovel-crane

A 12-page booklet describes with photographs and text construction details of the Lorain 50, a 25-ton, crawler-mounted shovel-crane. Thew Shovel Co. **306**

Crawler-mounted shovel-crane

A 20-page booklet contains details of construction and job applications for the ¾-yd Lorain 26 crawler-mounted shovel crane. Thew Shovel Co. **307**

Crawler crane excavator

A 20-page catalog describes and illustrates the features of a crawler crane excavator and depicts its use as a crane, magnet, clamshell, dragline, shovel and backhoe. American Hoist & Derrick Co. **308**

Rubber-mounted crane

A 60-ton, rubber-mounted crane equipped with outriggers hydraulically controlled from the cab is the subject of a 12-page catalog. The Thew Shovel Co. **309**

Rubber-mounted crane

Specifications, descriptions of exclusive features and recommended uses for a 12½-ton crane in a three-color folder. Little Giant Crane & Shovel, Inc. **310**

Rubber-mounted crane

Performance and dimensions of a rubber-mounted crane with a boom capacity up to one ton are given in an eight-page catalog. Drott Manufacturing Corp. **311**

Rubber-mounted cranes and shovels

A line of truck cranes and shovels, ranging in capacity from 8½ tons to 25 tons, and the components that make them up are described in a six-page bulletin. Quick-Way Truck Shovel Co. **312**

Dragline buckets

Operation of a line of dragline buckets with capacities ranging from ½ cu yd to 3 cu yd is explained in text and pictures in an eight-page brochure. Page Engineering Co. **313**

Bituminous paver

A two-color folder depicts the construction and performance of bituminous paver capable of operating at 102 fpm. Iowa Manufacturing Company. **314**

Bituminous distributor

A sprayer capable of applying from .075 gal to 3 gal per sq yd is described and specifications are included in a bulletin. Littleford Bros., Inc. **315**

Rollers

A six-page folder includes pictures and specifications of two steel wheel rollers, the Amrol 8 and the Amrol 12. American Marietta Company. **316**

Tandem rollers

Two tandem rollers, one in the 8- to 12-ton classification and the other in 10- to 14-ton, are the subject of a four-page bulletin. Both are offered with torque converter as standard equipment. Buffalo-Springfield Co. **317**

For More Information . . .

. . . Select the publications you want and circle the key numbers (shown at the end of each item) on the inquiry card at the end of this section.

Rollers

Various uses of a line of vibratory and static rollers are depicted in a four-page bulletin. Rosco Manufacturing Co. **318**

Compaction rollers

A line of sheepsfoot, pneumatic and flat rollers is described and illustrated and specifications included in a two-color catalog. American Steel Works. **319**

Scraper

Performance features and specifications of a 155-hp scraper with a heaped capacity of 9½ cu yd are in an eight-page booklet. Allis-Chalmers Manufacturing Co. **320**

Grader

Design and engineering features of a grader powered by a 115-hp diesel engine are presented in a 12-page booklet. Attachments are described. Caterpillar Tractor Co. **321**

Cutting edges

Descriptions of scraper and dozer cutting edges for a variety of work are included with specifications in a 12-page pamphlet. Caterpillar Tractor Co. **322**

Automatic grader blade control

The operation of an attachment for Caterpillar graders that automatically maintains a desired transverse slope is described in an illustrated folder. Preco, Incorporated. **323**

Crawler tractor

A 32-page booklet carries specifications on tractor, bulldozer front-end loaders and log loaders in the Eimco 103 crawler-tractor line. Eimco Corp. **324**

Crawler tractor

Engine, control and track components of the 335-hp D9 Caterpillar tractor are pictured and described in a 16-page booklet. Caterpillar Tractor Co. **325**

Crawler tractor

A crawler-mounted tractor, available in diesel or gasoline 37¼-hp engines, and a line of accessories and attachments are described in a colorful 28-page catalog. John Deere. **326**

Crawler tractor

A general purpose crawler tractor available with gasoline or diesel engine is described in an illustrated bulletin. Minneapolis Moline. **327**

Crawler tractors

A 20-minute, sound-color, 16-mm movie reports on the engineering and design features of a line of crawler tractors and on their various operations. The Oliver Corporation. **328**

Industrial tractors

A line of rubber-mounted and crawler tractors ranging in power from 13.4 hp to 95 hp and a broad selection of attachments designed for them are described in a 24-page booklet. International Harvester Co. **329**

Industrial tractor

A rubber-mounted utility tractor that features four-wheel drive and front wheel, four wheel or oblique steering is described in a four-page brochure. Napco Industries, Inc. **330**

Tractors and attachments

Descriptions and specifications for a line of rubber-mounted tractors and for a wide range of attachments designed for them are presented in a 24-page illustrated catalog. Massey-Ferguson Industrial Division. **331**

Utility tractors and equipment

Rubber-mounted and crawler tractors in 38½ hp, 42 hp and 47 hp and a broad range of equipment and accessories for them are described in an eight-page folder. Specifications are included. J. I. Case Co. **332**

Utility tractors

A line of tractors that can be fitted as loaders, backhoes, brooms, rotary mowers, cutterbar mowers and snow plows is described. Allis-Chalmers Manufacturing Co. **333**

Utility tractors

A four-color, 16-page brochure shows loaders, backhoes, dozers, fork lifts cranes and other industrial equipment used with tractors. Ford Motor Co. **334**

Tractor loader

A bucket selection chart, complete specifications and details of transmission available are in an eight-page folder about the TL 14 tractor loader. Allis-Chalmers Manufacturing Co. **335**

Front-end loader

Details of the components and capabilities of the 2½-cu-yd, 150-rpm 977H Traxcavator are in a two-color, eight-page booklet. Caterpillar Tractor Co. **336**

Front-end loaders and backhoes

A bulletin presents specifications and operating dimensions of backhoes and front-end loaders designed especially for Big Mo 500 and 600 tractors. Minneapolis Moline. **337**

Trench digger

Trencher for city and suburban work is described in 12-page folder. Special design and construction features are included in specifications. The Cleveland Trencher Co. **338**

Trench diggers

Mechanical trench digging units, capable of cutting trenches up to 24 in. wide and 60 in. deep and suitable for mounting on tractors, illustrated and detailed in a four-page folder. Earth Equipment Corp. **339**

Trench digger

A two-color, six-page folder gives details of a 1,350-lb self-propelled trencher with a capacity up to 12 fpm. Davis Manufacturing Inc. **340**

Transit mixer trucks

Advice for ready-mix concrete and construction companies on proper truck selection for specific job requirements is in an illustrated 36-page manual. Ford Motor Co. **341**

Transit mixer trucks

A six-page bulletin outlines the construction and performance of a line of concrete carriers designed for the ready-mix industry. Chain Belt Co. **342**

Transit mixers

Four-page brochure illustrates hard-surfaced concrete mixer drums with replaceable steel mixing blades. Mixers of 2 to 7½ cu yd listed. C. S. Johnson Co. **343**

Transit mixers

A line of 24 transit concrete mixers in standard sizes to 7 cu yd and available with separate engine drive, flywheel truck engine drive or standard truck engine drive are described in a brochure. Construction Machinery Co. **344**

Power take-off mixer

A six-page illustrated brochure explains the functions of features of power take-off concrete mixers. Chain Belt Co. **345**

Trucks

Case history reports on the operation of the Ford F-850 and the Ford F-1000 trucks make up an eight-page, illustrated pamphlet. Ford Motor Co. **346**

Transport trailers

A brochure presents basic details of a line of trailers designed to transport heavy construction equipment. Transport Trailers, Inc. **347**

For More Information . . .

. . . Select the publications you want and circle the key numbers (shown at the end of each item) on the inquiry card at the end of this section.

Bulk transports

A line of self-unloading bulk transports designed to carry lime, cement, sand, salt and similar freight, is described. Henderson Manufacturing Co. **348**

Truck bodies

An extensive line of truck bodies for carrying tools and materials, designed for ½-, ¾-, 1- and 1½-ton chassis, is described in a six-page folder. McCabe-Powers Body Co. **349**

Rear dump

Specifications, performance and details of components of a 27-ton, rear-dump, off-highway truck are in a 16-page catalog. International Harvester Co. **350**

Dump hoists

Load-rating charts for telescopic hoists, underbody hoists and direct lift hoists are included in a six-page folder. Young Spring & Wire Corp. **351**

Fork lift trucks

Design, engineering, construction and operation of fork lift trucks ranging in capacity from 3,000 lb to 5,000 lb. Allis-Chalmers Manufacturing Co. **352**

Fork lift trucks

Fork lifts in the 2,000 to 10,000 lb. capacity range, are pictured in two, four-page folders. Allis-Chalmers Manufacturing Co. **353**

Hydraulic lifts

Oil-hydraulic lifting devices, varying in capacity from 1,000 to 100,000 lbs, are described in a 20-page catalog. Rotary Lift Co. **354**

Mobile handlers

Travelift self-propelled hydraulically operated carriers described in catalog which includes illustrations of small and large straddle equipment. Travelift Engineering, Inc. **355**

Lift platform

A line of lift platforms that raise hand trucks and skids to the level of shelves, trucks, trailers and elevated floors is described in a two-color brochure. Wayne Pump Co. **356**

Crushers

A bulletin illustrates and describes briefly each model of a line of crushers and indicates typical applications for each one. Pennsylvania Crusher Division of Bath Iron Works Corp. **357**

Rotary in-place mixer

A six-page brochure explains how a self-propelled rotary in-place mixer stabilizes highway base, subbase and surface courses. American-Marietta Co. **358**

Pierce Island Bridge, Portsmouth, N. H.

NEW GRANCO *S-I-P* BRIDGE FORMS STAY IN PLACE

Look easy? It *is* easy. And practical, too. Permanent, galvanized S-I-P (*Stay-In-Place*) steel forms for concrete bridge floors. No wood forms to remove. No shoring. No special tools. No safety nets or scaffolds required. All the work is done from above. S-I-P Bridge Forms fit between stringers. The minute they are set in place, you have a solid working deck, ready for reinforcing steel and concrete. Think of the construction time you save. Granco S-I-P Bridge Forms are available now. Want more information? Just mail coupon.

GRANCO STEEL PRODUCTS CO.
6506 N. Broadway, St. Louis 15, Mo.
A Subsidiary of GRANITE CITY STEEL CO.
Distributors in Principal Cities

GRANCO®

MAIL COUPON FOR BOOKLET

Contains product description, application data, job photos, installation illustrations.

Name____________________

Firm____________________

Address____________________

City__________ State__________

Mail to Granco address shown at left.
Attention Dept. E-609

Stressing rams

Illustrated folder describes automatic strand-stressing hydraulic ram and simple process of repeating stressing cycles without elaborate makeup. Four pages. International Prestressing Corp. **359**

Concrete accessories

Forming and stressing accessories illustrated, described and specified in a 60-page indexed catalog. Superior Concrete Accessories, Inc. **360**

Screeding machines

A four-page bulletin describes and illustrates portable screeding machines, hand tampers and screed stakes. Whiteman Manufacturing Co. **361**

Concrete finisher

Components of a concrete surface finisher are pictured and their operations explained in a two-color, six-page folder. Chain Belt Co. **362**

Concrete vibrators

A four-page bulletin describes several vibrators designed for use in different kinds of concrete construction. Whiteman Manufacturing Co. **363**

Concrete vibrators

Four models of vibrators powered by interchangeable units (electric, pneumatic or gasoline-driven) are described in a four-page catalog. Viber Co. **364**

Concrete cutting machine

An 18-hp concrete cutter capable of handling diamond blades from 10-in. to 20-in. in dia is the subject of a four-page folder. Felker Manufacturing Co. **365**

Concrete saws and blades

A bulletin gives photographs, descriptions and specifications of a line of concrete saws and blades. Champion Manufacturing Co. **366**

Steel concrete forms

Bulletin presents detailed information on the Rex line of curb, gutter, sidewalk and combination forms as well as flexible forms. 20 pages. Chain Belt Company. **367**

Corrugated forms

Load tables and installation instructions for corrugated metal Maco-Forms used in conjunction with V-Lok purlins included in a four-page brochure. Macomber, Inc. **368**

Concrete forms

Four-page folder describes Atlas Compo concrete forms with detail drawings of steel hardware and fittings for the plywood faced forms. Irvington Form & Tank Corp. **369**

Concrete forms

A 20-page catalog describes and illustrates complete line of steel-reinforced wood form panels and form hardware. Symons Clamp & Manufacturing Co. **370**

Steel strapped forms

Eight-page folder illustrates how steel strapping makes concrete forming easier and faster. Acme Steel Co. **371**

Stair forms

Welded metal forming system, custom built to specifications, is the subject of an eight-page catalog. The forms are suitable for either precast or cast-in-place concrete. Stairbuilders. **372**

Plaster mixer

A plaster mixer engineered specifically for fast, machine plastering work is described in a four-page folder. Challenge-Cook Bros. **373**

Gasoline powered drill

A 30-lb, portable, gasoline-powered drill that may be operated in any position is the subject of a four-page brochure. Schnacke Mfgr. Corp. **374**

Drilling equipment

Details and illustrations are given in eight-page leaflet on proper operational and maintenance procedures for coupled rock-drill steels. Thor Power Tool Co. **375**

Hydraulic borer

Brochure shows equipment for shallow hole boring and sampling requirements. Specifications and methods of mounting the hydraulic soil sampling and coring machine are given. The Giddings Machine Co. **376**

Rolling scaffolds

Details for light and heavy-duty, general-purpose rolling scaffolds are included in a four-page folder. Superior Scaffold Co. **377**

Engines

Twenty-seven diesel and carbureted engines, in four-, six- and eight-cylinder versions, are detailed in a four-page pamphlet. Horsepower ratings range from 16.4 to 385. International Harvester Co. **378**

Gas engines

Two brochures give performance data, specifications and applications for engines rated at between 115 and 675 hp. Waukesha Motor Co. **379**

For More Information . . .

. . . Select the publications you want and circle the key numbers (shown at the end of each item) on the inquiry card at the end of this section.

Gas engines

A line of 6- and 12-cylinder lp gas and gasoline engines rated at between 265 and 605 hp and recommended for use in water and sewage treatment plants are described. Climax Engine Mfg. Co. **380**

Gas turbines

Ruston gas turbine is the subject of a 12-page bulletin. Applications, performance curves, and specifications are included. Thompson Ramo Wooldridge Inc. **381**

Building Materials

High-strength steel

Physical properties and special features of a low-alloy, high-strength steel are described in a four-page brochure. Youngstown Sheet and Tube Co. **382**

Curtainwall panels

Eight-page catalog about company's line of curtainwall panels includes construction details and specifications. Seaporcel Metals, Inc. **383**

Concrete curtain walls

Color film with sound track presents an 18-minute summary of design techniques in concrete curtain wall construction. Examples indicate variety of color, texture and casting patterns possible. Version adapted to TV also available. Portland Cement Association. **384**

Vinyl coated steel

Architectural applications of coated steel to both doors and wall panels outlined in a pair of illustrated four-page folders. Manufacturing techniques plus a list of individual product manufacturers are included. United States Steel Corp. **385**

Porcelain enamel panels

A 12-page booklet presents product information and case histories about the use of architectural porcelain enamel panels. Includes adhesives and chemical welding. The Erie Enameling Co. **386**

Metal coatings

Bulletin describes heat and corrosion-resistant silicone and silicone-ceramic coatings for metals. 20 pages. The Dampney Co. **387**

Glulam structures

Architectural review, design procedures, tables, specifications, typical details and load calculations for glued, laminated timber structures packed into a 32-page design manual. Unit Structures, Inc. **388**

Wood siding

The properties, uses and design of wood siding are explained in a 16mm color-sound movie. Running time is 14 min. Western Pine Association. **389**

PUTS SCHOOLS UNDER ROOF FAST

72,237 square feet of Macomber V-LOK cut construction time on Iowa's Fort Madison High School.
ARCHITECT-ENGINEER: Karl Keffer Associates
CONTRACTOR: Fane F. Vawter & Co.

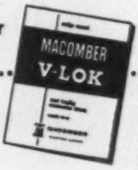
MACOMBER **V-LOK**

saves weeks of construction time

V-LOK rigid, interlocking steel framing erects in days with roof on — ready for interior finishing, regardless of weather. This high-strength structure combines quality with overall construction economy; and no-waste-motion assembly speeds occupancy.

Your local Macomber Representative can show you how V-LOK is engineered as a complete concept specifically designed for your school — how V-LOK allows complete architectural freedom, complies with building codes and fire safety regulations, and permits future school expansion

Utilize V-LOK'S speed, economy and earlier occupancy for your next school.



LATEST PRODUCT FACTS:
Get your copy from your local Macomber Sales Representative or write today for this informative manual.

NAME...
COMPANY.............................POSITION...................
ADDRESS..
CITY...................................STATE....................

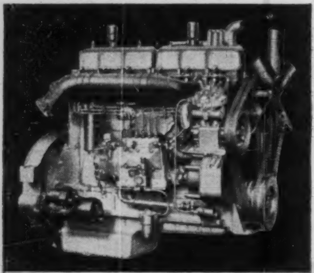
ENR-3-60V

MACOMBER
CANTON 1, OHIO

ALLSPANS • V-LOK • V-BEAMS • V-GIRDERS
BOWSTRING TRUSSES • ROOF DECK • STRUCTURAL STEEL

SEE OUR CATALOG IN SWEET'S OR WRITE FOR COPY

MOST PRODUCTION with WAUKESHA POWER



A typical Waukesha medium six-cylinder Diesel. Other Diesel, gasoline, and gas models—up to 1200 hp.

For service—in any country—or any climate—stamina and dependability are built-in. Power packed—to pay profits in fast, smooth performance, fuel economy, and low upkeep—Waukeshas are the choice of operators and owners alike. Engine-Generator Sets (ENGINATORS®) for all standard fuels . . . from 50 to 800 KW.

488

WAUKESHA MOTOR COMPANY, WAUKESHA, WISCONSIN
Factories at Waukesha, Wisconsin, and Clinton, Iowa / New York • Tulsa • Los Angeles

West Coast lumber

Information about the grades, uses and specifications of West Coast lumber is contained in a 20-page booklet. West Coast Lumbermen's Association. 390

Plywood siding

Combined siding-sheathing in the form of resin-overlaid fir plywood panels, is described in a 12-page brochure. Douglas Fir Plywood Association. 391

Partitions

Technical Bulletin contains details, specifications and discussion of applications of hollow partitions built with ¾-in. channel studs and metal lath. Metal Lath Manufacturers Association. 392

Partitions

Folder illustrates and provides specifications for prefabricated metal stud hollow partitions in non-bearing applications. Metal Lath Manufacturers Assoc. 393

Metal flooring

A 12-page bulletin describes steel and aluminum flooring and stair treads, both solid and open types. Plate and panel sizes, loading tables and other engineering data are included. Joseph T. Ryerson & Son, Inc. 394

Roofing

Specifications, details and design data for built-up roofing are in a 168-page publication. Fibreboard Paper Products Corp. 395

Glass patterns

A selection of 26 patterns in decorative rolled and wire glass and their specifications are contained in a 32-page booklet. Libbey-Owens-Ford Glass Co. 396

Aluminum Windows

New edition of aluminum window specifications gives expanded treatment to the subjects of alloys, material thickness, fasteners, fin trim, tolerances and protective coatings. 32 pages. Aluminum Window Manufacturers Assoc. 397

Window glazing

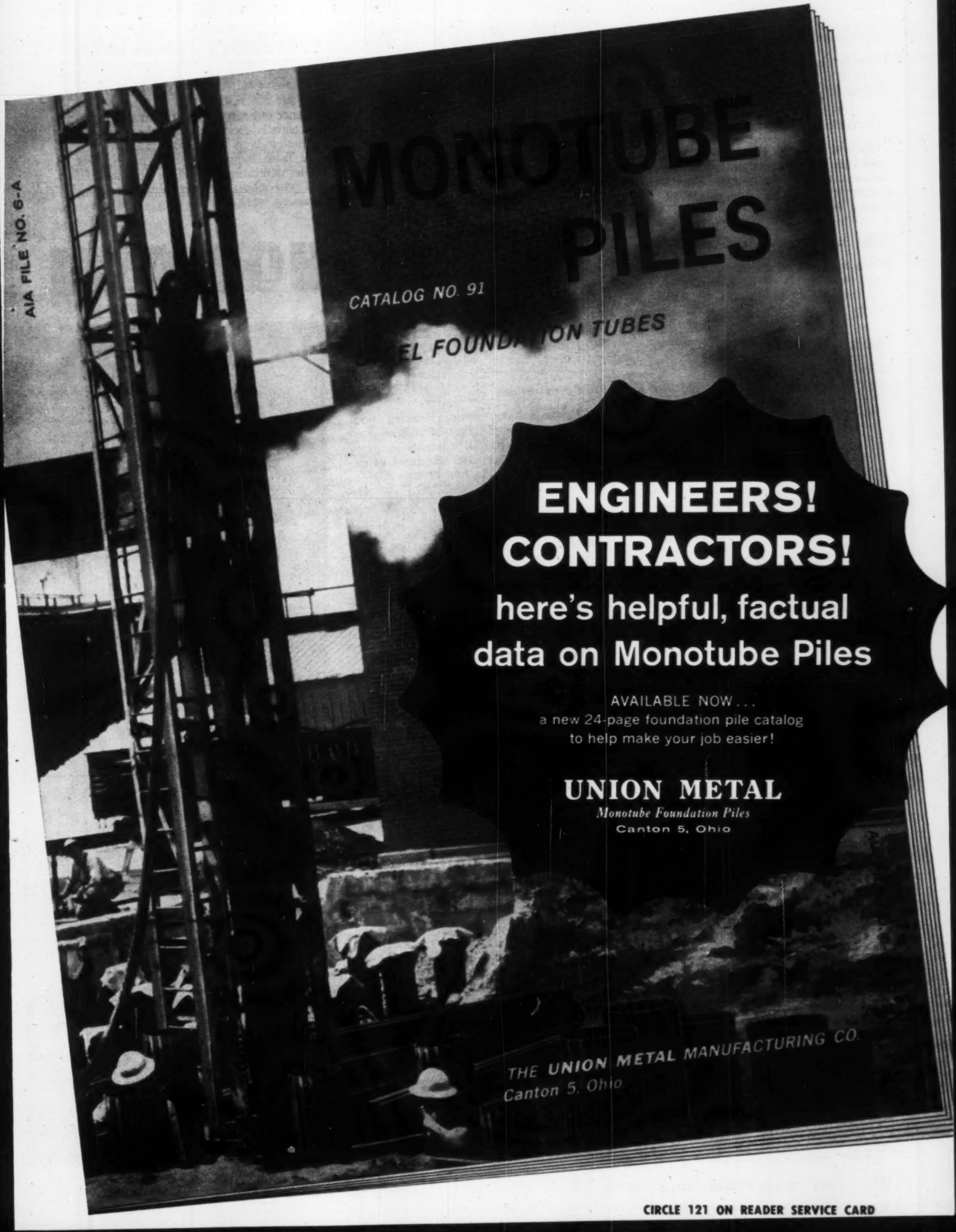
A four-page catalog on aluminum glazing bead—snap in metal strips that replace window putty. Pemko Manufacturing Co. 398

Steel gratings

Catalog provides tables, specifications and illustrations of open steel grating sections and stair tread units. 12 pages. Kerrigan Iron Works Co. 399

For More Information . . .

. . . Select the publications you want and circle the key numbers (shown at the end of each item) on the inquiry card at the end of this section.



AIA FILE NO. 6-A

MONOTUBE PILES

CATALOG NO. 91

STEEL FOUNDATION TUBES

THE UNION METAL MANUFACTURING CO.
Canton 5, Ohio

ENGINEERS! CONTRACTORS!

here's helpful, factual data on Monotube Piles

AVAILABLE NOW . . .
a new 24-page foundation pile catalog
to help make your job easier!

UNION METAL
Monotube Foundation Piles
Canton 5, Ohio

CIRCLE 121 ON READER SERVICE CARD

Aluminum grating

Structural applications of anodized aluminum grating are illustrated in a six-page folder. Klemp Metal Grating Corp. **400**

Concrete products

Expansion joints, waterstops, curing compounds, admixtures and other concrete construction products are described and pictured in 12-page catalog. W. R. Meadows, Inc. **401**

High density concrete products

Catalog describes radiation shielding block and components of high density concrete with specifications and tables. Ray Proof Corp. **402**

Masonry joints

Four-page booklet describes three new polyvinyl chloride joints for control or expansion applications in masonry construction plus Rodofoam joint filler and Rodofix sealing compound. Electrovert, Inc. **403**

Concrete admixtures

Water reducing admixtures for concrete described in four-page folder. Marathon Div. of American Can Co. **404**

Patching compounds

Technical bulletin describes concrete and masonry surfacing and patching compounds of epoxy resin based material. Six pages. The Clinton Company. **405**

Masonry waterproofing

An eight-page booklet shows how to protect masonry from efflorescence, staining, spalling and paint damage with silicone masonry water repellents. General Electric Co. **406**

Masonry waterproofing

A four-page folder describes the action and installation procedure for a silicone water repellent for masonry surfaces. A. C. Horn Companies. **407**

Concrete sealers

Information on sealing products for highways, bridges, airports and other concrete construction in an illustrated catalog. W. R. Meadows, Inc. **408**

Concrete sealer

Application directions and performance characteristics of a rubberized sealer for concrete pavements and parking decks are carried in a three-page technical bulletin. Maintenance, Inc. **409**

Concrete floor finish

Application method and advantages of floor-hardening Colorandum is described in a four-page bulletin. A. C. Horn Companies. **410**

Calcium carbide

The how, what and why of calcium carbide, its manufacture and applications are outlined in a 16-page brochure. National Carbide Co. **411**

Pile shells

A brochure describes the use of foundation pile shells for building and bridge projects. Armco Drainage & Metal Products, Inc. **412**

Adhesive products

A 12-page catalog contains application and property information on a complete line of adhesives, coatings and sealers for building construction. Also describes polysulfide sealers and protective metal coatings. Minnesota Mining and Manufacturing Co. **413**

Plastic extrusions

A 71-page booklet includes articles about the design and application of custom plastic extrusions. It also contains property tables and cross-sectional diagrams of extruded moldings. Anchor Plastics Co. **414**

Sound insulation

Sound transmission loss information available on a resilient clip system used with a prefabricated metal stud assembly. Four-page bulletin. Metal Lath Manufacturers Assoc. **415**

Thermal insulation

A 16-page guide to the use of thermal insulating material emphasizes a method which enables engineers to determine the point at which insulation gives the greatest financial return for its cost. National Insulation Manufacturers Assoc. **416**

Duct lining

Glass-fiber duct lining for insulation and sound absorption is described and illustrated in an eight-page brochure. Johns-Manville Corp. **417**

Installed Equipment

Waste treatment plant

A two-story sewage treatment plant is described in eight-page catalog that gives operation characteristics and specifications. Yeomans Bros. Co. **418**

Waste treatment plants

Bulletin gives detailed descriptions of compact sewage treatment plants utilizing the contact stabilization process. Walker Process Equipment Inc. **419**

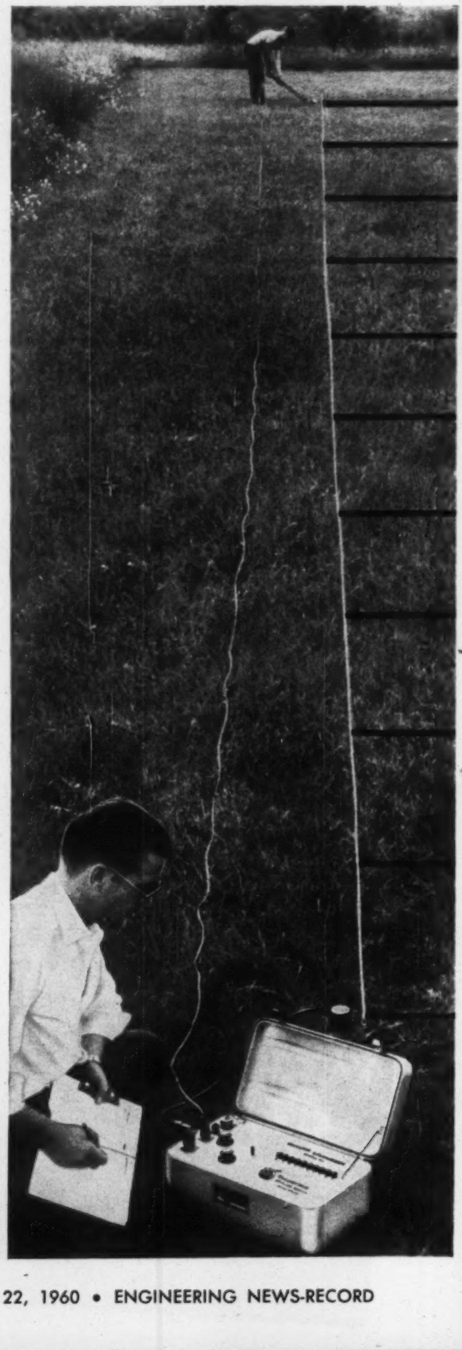
For More Information . . .

. . . Select the publications you want and circle the key numbers (shown at the end of each item) on the inquiry card at the end of this section.

SUBSURFACE EXPLORATION

Dirtmovers: Profit by complete, accurate pre-bid information on presence or absence of bedrock in cut areas and depth to bedrock; establish quantities and types of materials to be excavated; locate suitable borrow pits and location of water table; determine rippability of materials; aid scheduling of equipment during excavation work.

HOW YOU



Paving Contractors: Profit by establishing gravel deposits, volume and type, nearest to the work site.

Consulting Engineers: Profit by predesign subsurface information for buildings, bridges and highways.

Highway Engineers: Establish presence or absence of rock for highway design work; pre-bid classification of materials, volume of materials, subsurface structures.

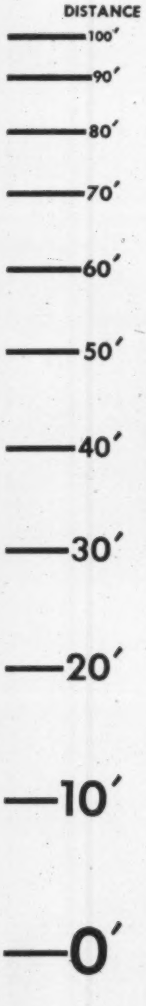
Architects: Establish stability of subsurface materials and depths for all planning.

Quarry Producers: Profit by accurate information of location and size of aggregate deposits, amount of overburden.

Mining Engineers: For example; locate pre-glacial stream channels for placer exploration, determine bedrock depths.

Bridge Builders: Economically establish stability of subsurface structure for foundations.

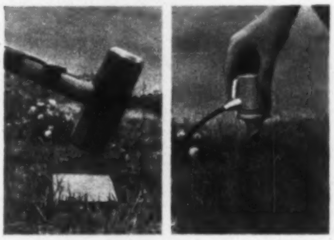
PROFIT WITH THE MD-1...



Today's profit squeeze and intense competition in the engineering and construction industry can make the MD-1 Engineering Seismograph the most important cost-saving tool you own.

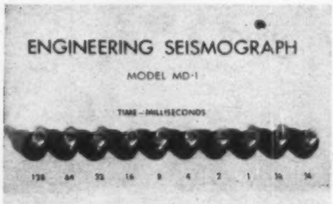
Why? Because daily throughout the world, MD-1 analyses of subsurface material conditions are being quickly converted into profits in the many ways listed above. Yet this vital tool requires no specialized training to operate. It develops accurate, reliable information in the simple manner shown here:

HAMMER PLUS GEOPHONE



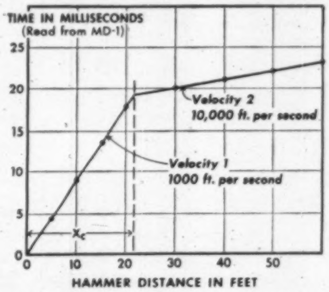
A sledge hammer is struck against a metal plate at known distances from the MD-1. As blow is struck, a switch closes on the hammer, starting the MD-1's electronic counter. The sound waves initiated by the blow are picked up by a geophone, also connected to the MD-1. The time of travel of the *first* or fastest sound wave to reach the geophone is read directly from the MD-1's electronic counter lights.

ELECTRONIC COUNTER



This travel time is determined by the depth and type of the material; the denser the material, the faster the sound waves travel.

PLOTTING MD-1 READINGS



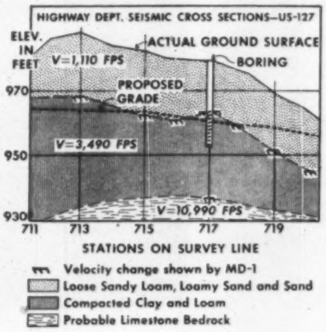
Recorded travel times are plotted on a graph. This time-distance curve represents the velocities of the materials encountered. These velocities indicate the types of materials and each break in the curve indicates a change in material.

DEPTH EQUATION

$$D = \frac{X_c}{2}\sqrt{\frac{V_2 - V_1}{V_2 + V_1}}$$

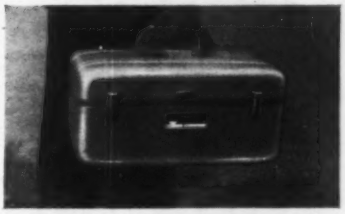
Using the above formula, the depth to denser materials or bedrock is provided. D is the depth, X_c is the hammer distance at which the velocity change occurs, V_1 is the velocity of the top material, and V_2 is the velocity of the second material. Depths to deeper layers are determined the same way.

SUBSURFACE PROFILE



The depths and materials are then marked on a profile map of the job so that subsurface conditions will be considered in the planning and bidding of the work.

PORTABILITY



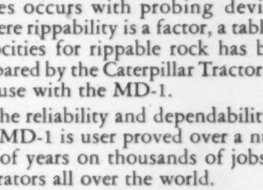
Because of its small size and light weight, the MD-1 can easily be used in areas inaccessible to drilling rigs. Also important, boulder strewn soils do not impair accuracy of findings as sometimes occurs with probing devices. Where rippability is a factor, a table of velocities for rippable rock has been prepared by the Caterpillar Tractor Co. for use with the MD-1.

The reliability and dependability of the MD-1 is user proved over a number of years on thousands of jobs by operators all over the world.

See how you can profit on your next job with this simple to operate tool of the new age in earthmoving. Ask for a demonstration—operate it yourself after a few minutes instruction.

Some MD-1 Owners

Contracting & Materials Co.
Nello L. Teer Co.
Hunting Survey Corp., Ltd.
Peter Kiewit Sons' Co.
Dickerson, Inc.
Euclid, Division of GMC
Caterpillar Tractor Co.
Michigan State Highway Dept.
Ontario Dept. of Highways
Alcoa (Aluminum Co. of America)
U. S. Bureau of Public Roads
U. S. Corps of Engineers
DuPont



Geophysical
SPECIALTIES COMPANY
15409 Robinwood Drive • Hopkins, Minn.
Phone: WEst 8-6877 Cable: Geospec

CIRCLE 123 ON READER SERVICE CARD

PIPE THAT DOESN'T GET COLD FEET IN WET TRENCHES

This cast iron pipe was installed to carry water to an important industrial site in Indiana.

At the time of installation, weather conditions were severe; the trenches were wet and muddy.

Still, the cast iron pipe was easily and speedily assembled, enabling the contractor to complete the job well ahead of the deadline.

Cast iron pipe does not get cold feet over rugged soil conditions. Its rugged design, corrosion-resistant qualities, and bottle-tight joints will withstand the most severe conditions.

Modern, cement-lined cast iron pipe will deliver a continued full flow of water for at least a century . . . and rarely requires repairs or replacement.

CAST IRON PIPE RESEARCH ASSOCIATION,
Thos. F. Wolfe, Managing Director,
3440 Prudential Plaza, Chicago 1, Illinois

CAST IRON PIPE
THE MARK OF THE 100-YEAR PIPE

CIRCLE 125 ON READER SERVICE CARD

Waste treatment plants

Clarification and filtration equipment for sewage and wastes treatment is described in a four-page catalog. The Eimco Corp. **420**

Waste treatment plants

Bulletin describes an activated-sludge type process for the oxidation of small sewage flows for use in shopping centers, airports, camps, etc. Eimco Corp. **421**

Waste treatment equipment

Complete line of liquid-solids separation equipment for chemical and metallurgical processing is described in four-page catalog. Eimco Corp. **422**

Waste treatment equipment

Unit that provides complete sewage treatment in one tank by combining five distinct operations is described in eight-page booklet. Dorr-Oliver Inc. **423**

Waste treatment equipment

How primary sewage treatment units accomplish grit removal, pre-aeration and clarification in a double compartment circular tank is described in four-page bulletin. The Eimco Corp. **424**

Sludge concentrator

A mechanical sludge concentrator for thickening and dewatering sewage and industrial sludges is illustrated and described in four-page brochure. Nichols Engineering and Research Corp. **425**

Sludge density controls

Automatic control of sludge density in sewage treatment plants is described in two-page flier. The Ohmart Corp. **426**

Blowers

Bulletin describes a line of turbine-type blowers for sewage treatment plants and applications in the chemical, plating, food-processing and other fields. The Spencer Turbine Co. **427**

Boiler room equipment

Line of steam generators, heat transfer equipment, pressure vessels, and valves, fittings and flanges are described in two illustrated brochures. Henry Vogt Machine Co. **428**

Condensers

Types and sizes of condensers for condensing steam and removing noncondensable gases are described in two-page flier. Schutte and Koerting Co. **429**

Storage tanks

A line of storage tanks from huge water tanks to domestic septic tanks is described in eight-page bulletin. Minneapolis Tank & Mfg. Co. **430**

Rotary distributors

Two types of rotary distributor, mast type and turntable type, for application with trickling filters are described in 11-page bulletin. Walker Process Equipment, Inc. **431**

Water filters

Specifications and details of operation of a "diatomite" pressure water filter system are given in four-page leaflet. Hagan Chemicals & Controls, Inc. **432**

Filters and strainers

Facts about filters and strainers are given in four-page leaflet that includes sizes and ratings. Ronningen-Petter Co. **433**

Filter control system

System for centralized filter operation and automatic filter backwashing is described in four-page bulletin. B-I-F Industries, Inc. **434**

Continuous processing

Equipment for processing finely divided solids suspended in liquids by agitation, classification, sedimentation and filtration is described in 16-page brochure. Dorr-Oliver Inc. **435**

Bar screen cleaning

Details of three control systems for automatic control of bar-screen cleaning in waste water treatment plants are given. Minneapolis-Honeywell Regulator Co. **436**

Chlorinator

Chlorinator that is available in manual and automatic models in capacities of 3 to 2,000 lb per day of chlorine gas is described in eight-page catalog. Fischer & Porter Co. **437**

Elevator equipment

Moving ramps and sidewalks plus a variety of standard and specialized elevators outlined in an illustrated four-page brochure. Montgomery Elevator Co. **438**

Air conditioning

Catalog contains engineering data, illustrations and specifications for three ceiling models and two window units of a high-velocity air-conditioning system. 36 pages. Carnes Corp. **439**

Tractor sprockets

Manufacture of a line of replacement sprockets for crawler tractors is explained in text and pictures. Caterpillar Tractor Co. **440**

For More Information . . .

. . . Select the publications you want and circle the key numbers (shown at the end of each item) on the inquiry card at the end of this section.

Air distribution

The Duct-D-Fuser, a tool for air distribution, which is inserted in a run of duct in place of the coupling, is described in a four-page folder. United Sheet Metal Co., Inc. **441**

Air filters

Description and specifications of a line of high performance disposable filters for air cleanliness. Six pages. Farr Co. **442**

Electronic air cleaner

A 16-page brochure contains descriptions, illustrations and sample specifications for several dust-removal units. Minneapolis-Honeywell Regulator Co. **443**

Light-air equipment

Dual purpose ceiling units, which combine recessed lighting and air diffusing equipment, are described in a 20-page booklet. Day-Brite Lighting, Inc., Barber-Colman Co. **444**

Sliding grille doors

Sliding grille barriers are specified in a four-page folder. Cornell Iron Works, Inc. **445**

Battery chargers

Literature covering a complete line of industrial pipe battery chargers is available. Automatic Switch Co. **446**

Electronic drive mechanisms

Drive described in four-page brochure consists of small wall-mounted control panel that converts single phase ac power to controlled dc power, a dc drive motor, and an operator's control station. The Louis Allis Co. **447**

Clutch plates

The manufacture, performance and uses of clutch plates and facings are described in a four-page folder. The S. K. Wellman Company. **448**

Gears and speed reducers

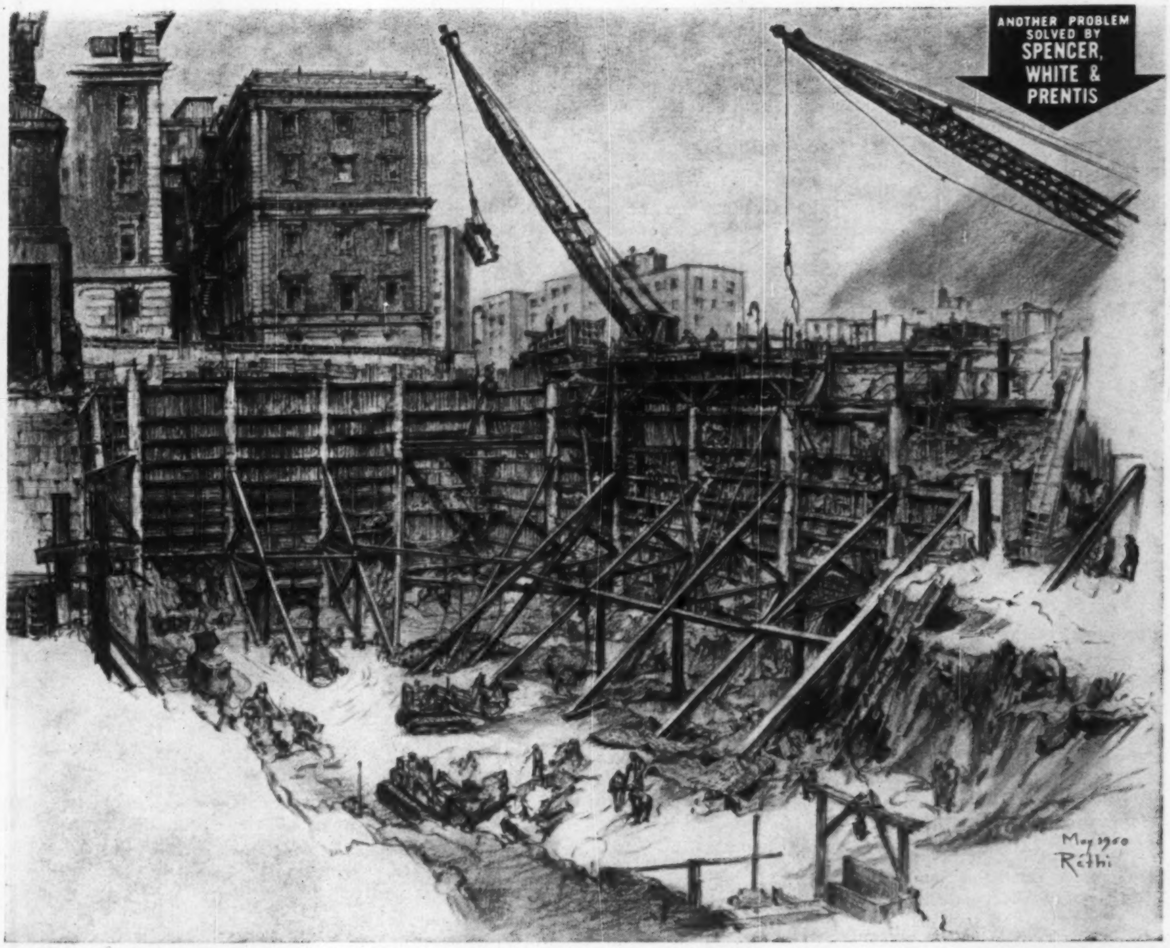
Information on sizes, rating and specifications of a line of gears and speed reducers and engineering data on their selection for specific job requirements is contained in a 246-page illustrated catalog. The Ohio Gear Co. **449**

Gear drives

Catalog illustrates a complete line of enclosed worm-gear drives, features simplified selection procedures and rating tables. Foote Bros. **450**

Hopper scales

An illustrated folder carries information on a line of suspension hopper scales for proportioning, batching and charging. Cardinal Scale Manufacturing Co. **451**


ANOTHER PROBLEM SOLVED BY SPENCER, WHITE & PRENTIS
May 1950
Rethi

Project: 100′ x 260′ foundation for addition to New York City's Mt. Sinai Hospital
Architect: Eggers & Higgins, New York City
Engineer: Weiskopf & Pickworth, New York City
General Contractor: Psaty & Fuhrman, Inc., New York City

NEW METHOD OF BANK SUPPORT:
DRILLED-IN CAISSONS USED AS MASTER PILES IN SHEETING 50′ DEEP CUT THROUGH ROCK FILL

In digging this foundation, the shovel unexpectedly struck large pieces of blasted rock, probably dumped as fill during subway excavating many years ago. Since the soldier beams of the originally-planned conventional system of sheeting and bracing could not be driven through these massive boulders, it became necessary to devise some other method of supporting the 50′ deep cut.

Solution: in what is believed to be their first use for such a purpose, Drilled-In Caissons, long a specialty of Spencer, White & Prentis, were successfuly employed as Master Piles. The 30″ diameter caissons, about 20′ on centers, were drilled and driven through the boulder fill. 10″ - 42# cores were then installed, concreted and socketed 4′ into bedrock. Descriptive literature on request.

Spencer, White & Prentis INC.
10 E. 40th St., New York 16, N. Y.
Detroit: 2033 Park Ave. • Chicago: 221 North LaSalle St. • Washington, D. C.: Tower Bldg.

CIRCLE 127 ON READER SERVICE CARD

Belt conveyor idlers

A 44-page catalog covers idler application and describes and illustrates more than 800 units. Tips on idler maintenance included. Barber-Greene Co. 452

Floodlights

Two types of floodlight designed to withstand vibration and shock are described in an illustrated six-page flier. Phoenix Products Co. 453

Pipeline compressors

Mechanical and hydraulic details for two-stage centrifugal pipeline compressors are given in nine-page booklet. Clark Bros. Co. 454

Unbreakable plumbing fixtures

Catalog describes complete line of unbreakable cast-aluminum plumbing fixtures including wall-hung and flush-valve urinals and toilets. Aluminum Plumbing Fixture Corp. 455

Drainline system

A completely integrated non-corrosive drainiine system that includes pipe fittings, traps and sinks made of polyethylene is described in a 19-page catalog. American Vulcathene Div. of the Nalge Co., Inc. 456

Storm drains

Asbestos-cement storm water drainage systems are treated in ten-page brochure that gives cost comparisons showing clay pipe advantages, design data and several sample installations. Johns-Manville Corp. 457

Underdrain pipe

A folder explains the use of asbestos-cement underdrain pipe in subsurface drainage systems for highways, airports, flood control projects and plant sites. Johns-Manville Corp. 458

Clay pipe

Specifications and applications of clay pipe, clay processing, clay pipe research and basic clay products are treated in six-page brochure. National Clay Pipe Manufacturers, Inc. 459

Rigid pvc pipe

Catalog includes typical applications and complete technical data on rigid unplasticized polyvinyl chloride pipe and fittings—a convenient glossary of terms is included in this catalog. Glamorgan Pipe & Foundry Co. 460

Fiber pipe

Bituminous fiber pipe for drainage, sewer and septic tanks is discussed in 27-page booklet with design data, specifications and installation setups. Line Material Industries, McGraw-Edison Co. 461

Clay pipe joints

Pipe joints that utilize a plastic bond plus an "O" ring and grooved spigot in four-page leaflet. The Evans Pipe Co. 462

Hose couplings and fittings

Chart, leaflet and catalog provide references for a line of reusable hydraulic hose, couplings and fittings. Anchor Coupling Co., Inc. 463

Welded fittings

A 12-page bulletin describes the new seamless welded fittings in the company's line. Midwest Piping Co. 464

Pipe insulation

Thermal and physical characteristics of one-piece pipe insulation for service from below zero to 350 F described in four-page flier. Baldwin-Ehret-Hill, Inc. 465

Water analyzers

Thirty-two page catalog presents four types of water analyzers—continuous colorimetric, continuous titrametric, continuous turbidity analyzers, and portable photoelectric colorimeters. Hach Co. 466

Material sampler

Bulletin describes an automatic sampler, which takes periodic "cuts" from a stream of moving material in a continuous flow process. Hardinge Co., Inc. 467

Hour meters

The use of hour meters in maintenance of powered equipment is explained and an extensive line of meters is described in 12 pages. John W. Hobbs Corp. 468

Density-moisture gage

An eight-page booklet on an instrument for field measurement of soil moisture content and density. Nuclear-Chicago Corp. 469

Magnetic gages

Catalog gives details of liquid level gages designed for use where glass and its gaskets cannot be used. Jerguson Gage & Valve Co. 470

Temperature detector

Details of resistance-type temperature detector, sealed to prevent contamination, are given in two-page specification. Bailey Meter Co. 471

Alarms

Fluid-flow-rate alarms for signaling or simple functions are treated in four-page flier. Brooks Rotameter Co. 472

For More Information . . .

. . . Select the publications you want and circle the key numbers (shown at the end of each item) on the inquiry card at the end of this section.

Control valves

Operating features, flow capacity and specifications are given for a line of control valves, hose valves and valves especially applicable to the process industries. General Kinetics Corp. 473

Oil control valve

Illustrated four-page brochure details a valve designed for precision control of oil flow to any type burner. Hauck Manufacturing Co. 474

Bronze gate valves

Catalog contains eight pages of dimension charts illustrating a line of bronze valves. American Valve Mfg. Co. 475

Throttle valves

Series of valves for control of compressed air in a four-page flier. Air hose fittings are also shown. Hose Accessories Co. 476

Check valves

Four-page bulletin describes double cushioned check valves, main feature of which is design that prevents shock due to back surge. Golden-Anderson Valve Specialty Co. 477

Check valve

Electric double-cushioned check valve is described in seven-page booklet. Golden-Anderson Valve Specialty Co. 478

Valves

A 40-page catalog is available for a line of valves that are air or solenoid pilot operated. Hoffman-Odum Co. 479

Valves

A two-page flyer describes valves with spherical union connections which compensate for up to 10-deg misalignment of vessel tappings in any direction. Jerguson Gage & Valve Co. 480

Self-priming pumps

Catalog gives specifications and performance data for a line of self-priming pumps with capacities from 30 to 1500 gpm. Leyman Mfg. Co. 481

Waste handling pumps

Eleven different types of pumping equipment for handling waste materials in four-page leaflet. Yeomans Bros. Co. 482

Submersible pumps

Brochure describes submersible pumps in the 3,550-rpm and 1,750-rpm range. Applications are given. Sumo Pumps, Inc. 483

Centrifugal pump

Four-page bulletin describes centrifugal pump with canned stator and flow-through type rotor-impeller. The Corley Co., Inc. 484

THE INSIDE STORY

ROEBLING
ROYAL-1105-BLUE

ROYAL BLUE—*we put a lot of work into it—You get a lot of work out of it.*

ROEBLING ROYAL BLUE WIRE ROPE This is rather a long view of a wire rope that's a real work horse. Time and tests have taught us at Roebling that wire rope users *want* the long view. What else, they say, are they spending their money for?

Here, you're looking through a length of Royal Blue whose core has been removed to show the uniformity and symmetry of the rope structure. You see how concerned we are with internal security.

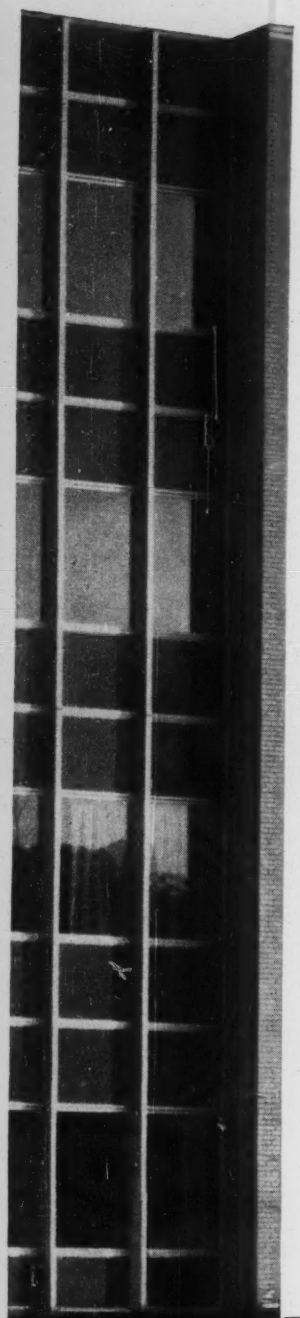
This is one of the reasons why Royal Blue lives up to the day-to-day demands made upon it. High stresses and unavoidable overloads, abrasion, fatigue, impact, crushing, sheave pressures and abusive drum-winding, to name the major ones.

We have to know that the rope we build will do what we sell it to do. Numerous quality-control measures help us—as they do you—to take the long view of Royal Blue. For details about long-lasting Roebling Royal Blue, ask your wire rope distributor or write Roebling's Wire Rope Division, Trenton 2, New Jersey.

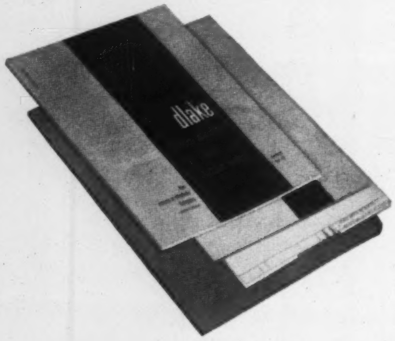
ROEBLING

Branch Offices in Principal Cities • John A. Roebling's Sons Division • The Colorado Fuel and Iron Corporation

CIRCLE 129 ON READER SERVICE CARD



motel to
skyscraper,
where quality
needs be
better than best,
specify Adlake –
first name in
non-residential
windows
of aluminum



for your desk file –
complete catalog and
architect specifications,
mail coupon.

A+dlake
windows and
curtain walls

Dept. K-4909

The Adams & Westlake Company
Elkhart, Indiana

103 YEARS

Please mail new catalog on Adlake double hung, pivot, projected windows and curtain walls.

name ☐ Architect
firm ☐ Builder
address ☐ Owner
☐

Pneumatic pump

Pneumatic pump that handles oils, paints, brine, etc., is described in four-page flier. Pump has 72-gpm capacity at heads to 30 psi. Yeomans Bros. Co. **485**

Volatile liquid pumps

Volatile liquid pumps are treated in a six-page bulletin that includes cross-section drawings of the standard short coupled vertical turbine pump and the canned type vertical turbine pump. Layne & Bowler, Inc. **486**

Pump motors

Electrical and mechanical features of motors designed for work with close-coupled centrifugal pumps are depicted in a bulletin. Wagner Electric Corp. **487**

Methods

Crushers

A 40-page handbook describes and discusses the various methods of crushing. Pictures and charts are included. Pennsylvania Crusher Division, Bath Iron Works Corp. **488**

Compaction

A 12½-minute, 16 mm sound color film illustrates how fast compaction equipment can reduce job costs. Hyster Co. **489**

Excavation tables

One-page estimating sheet provides quick answers to questions on support requirements in deep excavations. Contact Sheeting, Inc. **490**

All-weather roads

Eight basic stabilization methods for building all-weather roads are illustrated and described in an eight-page booklet. American Marietta Co. **491**

Soil-cement roads

The equipment, sequence of operations and principles involved in making soil-cement highways is given in an eight-page bulletin. American-Marietta Co. **492**

Salt stabilization

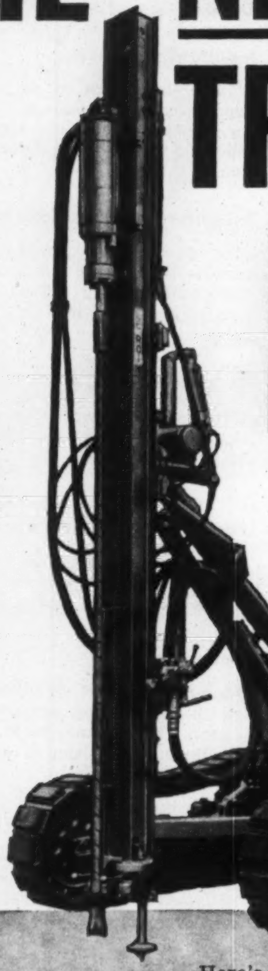
The use of salt for stabilization of primary and secondary roads is described in a 24-page illustrated booklet. Salt Institute. **493**

Motor selection guide

A pocket-size card offers quick reference to frame size and book price for GE a-c motors from ¾ to 125 horsepower. General Electric Co. **494**

For More Information . . .
. . . Select the publications you want and circle the key numbers (shown at the end of each item) on the inquiry card at the end of this section.

THE NEW LE ROI TRAC-NEWMATIC



puts
down
big
4 inch
hole
fast!

Drills at any angle

... on uneven terrain

... straight ahead

... straight down

... or over-the-tracks

DOWN
DEEP
FOR
MODERN
DRILLING

Here's Le Roi's brand-new, hard-working crawler drill — The Trac-Newmatic.

The Trac-Newmatic carries a big 5-inch drifter on an extra-sturdy air-powered feed shell . . . all mounted on a hard-lugging crawler that can pull a 600 rotary along with it over tough terrain.

The 5-inch drifter features a striking-bar design that efficiently squeezes every ounce of power out of the available air . . . minimizes leakage and blow-by . . . drills 4-inch hole fast. What's more, the drifter has forward, neutral, and reverse rotation to assure fast driving, easy extracting, and speedy steel-uncoupling or coupling.

An air-motor driven hydraulic pump is used to quickly position the feed shell for breast- or lift-hole drilling either straight ahead or over the tracks to give a wide drilling pattern from a single location. A standard model with hand-operated hydraulic pump to raise and lower the boom is also available.

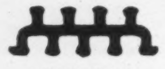
Tramming is easy, too . . . two hefty 7½ hp reversible air motors give the Trac-Newmatic plenty of power, while the oscillating tracks permit tramming or parking even on irregular terrain. Controls are mounted for both convenient operation and good visibility, and a "deadman" feature anchors the unit in place when the tramming levers are released.

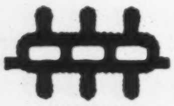
See the Trac-Newmatics at your Le Roi distributor—or write us for more detailed information. Le Roi Division, Westinghouse Air Brake Co., Milwaukee 1, Wis.

LE ROI
NEWMATIC®
AIR TOOLS

AT-013

PORTABLE AND TRACTAIR® COMPRESSORS • STATIONARY COMPRESSORS • AIR TOOLS





THEY
SEAL

THEY
STRETCH

THEY
SHIFT

WATER SEALS WATER STOPS
have more years of proved performance!

And Water Seals water stops have more miles of proved performance, too! This record, plus the ease of application and the broad variety of shapes and sizes of Water Seals water stops are all the proof you need of their desirability for your own concrete jobs. If you are after truly water-tight sealing between successive concrete pours, be sure to specify Water Seals water stops. They stand up under high temperatures and heads, even under extremes in shifting and stretching. They are unaffected by acids, alkalies, organic chemicals. Full engineering data and dimension drawings available immediately. Use the coupon.

LABYRINTH
Water Stops. Unique, low cost installation! No form splitting required: just nail 'em in place! 2, 3 or 4 rib styles.

FLEXSTRIP
Water Stops. For horizontal or vertical construction joints, especially under extreme conditions of separation. Variety of widths.

CELLULAR
Water Stops. For expansion joints where shearing stress is anticipated. Three rib style most popularly used.

Water Seals, Inc. Dept. 4
9 South Clinton Street
Chicago 6, Illinois
Send engineering data and literature on Water Seals water stops.

NAME____________________
FIRM NAME____________________
ADDRESS____________________
CITY______________STATE__________

SEND TODAY

Diesel service directory

World-wide sales, service and parts outlets for Detroit Diesel engines are carried in a 44-page directory. Detroit Diesel Engine Division, General Motors. **495**

Industrial truck costs

Manual shows how to calculate costs of depreciation, operation and maintenance for gasoline-powered and battery-powered industrial trucks. Lead Industries Association. **496**

Subsurface earth exploration

The operation of a seismic instrument capable of exploring soil to a depth of 50 ft or more without drilling or explosives is explained in a bulletin. DynaMetric, Inc. **497**

Concrete finishing

Flyer and folder explain operation and detail specifications of the Viking float and finishing machines. Dart Manufacturing Co. **498**

Proper grouting practices

Information on correct mixes, methods of grouting and applications of Embeco nonshrink grout. The Master Builders Co. **499**

Curing concrete

Four-page booklet describes a treatment, which protects the surfaces of concrete, cement block, and cinder block from weathering and chemical attack. Concut Industrial Products. **500**

Concrete darkening

A four-page folder describes a semi-paste pigment that is used for darkening both air entrained or regular concrete. Sun Chemical Corp. **501**

Polyethylene sheeting

The use of polyethylene sheeting for curing concrete and preventing loss of concrete solution into subgrades is explained in a four-page brochure. Visking Co. **502**

Brick wall leaks

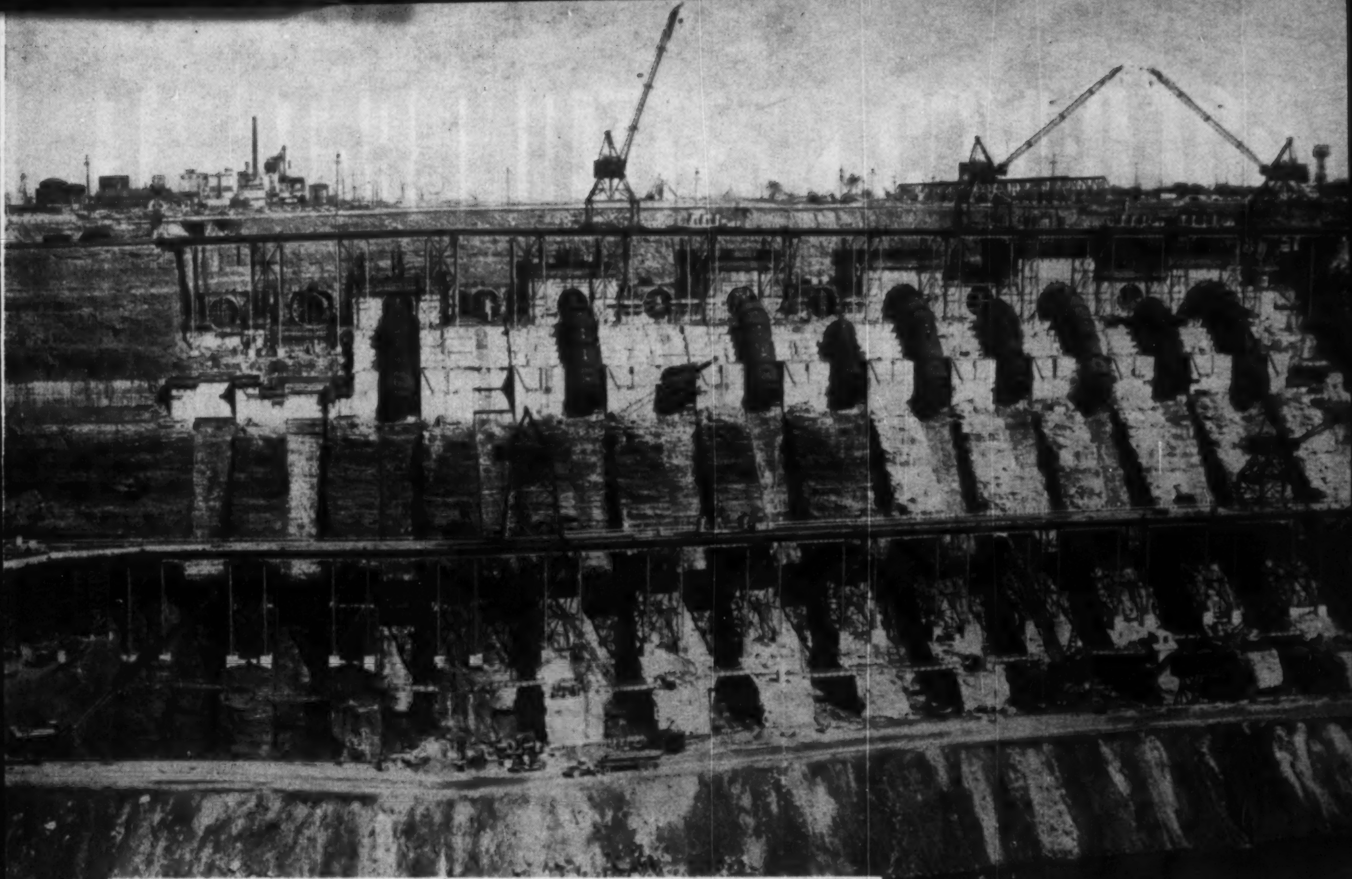
Eight-page illustrated brochure explains why brick walls leak and how Horn Hydratite Plus can prevent leaks. A. C. Horn Co., Div. of Sun Chemical Corp. **503**

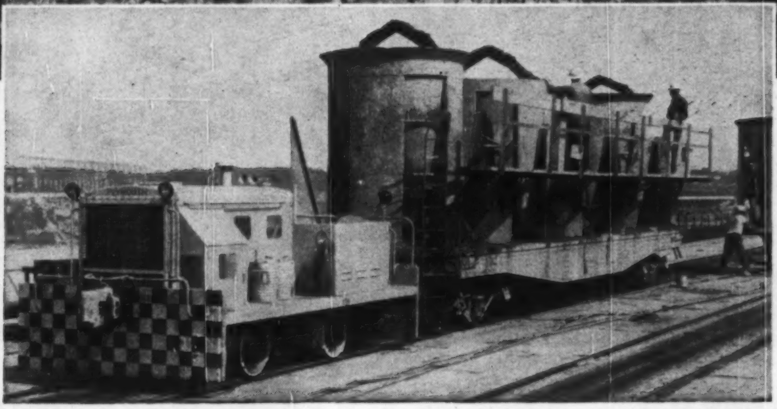
Water treatment

Instrumentation for treatment of industrial water is subject of 28-page booklet describing several water treating systems. Minneapolis-Honeywell Regulator Co. **504**

For More Information . . .

. . . Select the publications you want and circle the key numbers (shown at the end of each item) on the inquiry card at the end of this section.





Main Generating Plant — Niagara Power Project — Lewiston, New York

Like a massive stage setting, viewed from the Canadian side, is the Main Generating Plant of the Niagara Power Project of the Power Authority of the State of New York. Located five miles below Niagara Falls, this power project will harness the full potential of the United States share of Niagara Falls. When completed, it will produce 1,950,000 KW of electrical power.

"Plymouth *versatility* speeds power project"

Six remote-controlled Plymouth Locomotives help speed construction operations for Merritt-Chapman & Scott Corporation, contractor for the main generating plant of the giant Niagara Power Project. In round-the-clock operations, these locomotives move concrete cars from the batch plants to the gantry cranes which place the concrete buckets in position for pouring.

Each Diesel-hydraulic Locomotive is operated from a control station on the concrete car, where the operator can oversee car spotting under the batch plant and attach the crane clevis bolts to the pouring buckets at the construction site. Visibility is excellent in both directions and full control is exercised without an operator on the locomotive itself.

Special problems find quick solution in Plymouth Locomotives. On-the-job dependability and minimum maintenance, coupled with smooth hydraulic power transmission have made Plymouth the choice on construction and tunnel jobs the world over. To check on a Plymouth Locomotive or Mine-O-Motive suited to your haulage needs, simply send a brief outline of your operations to: The Fate-Root-Heath Company, Dept. A-4, Plymouth, Ohio. Purchase Plans available.

RAIL POWER

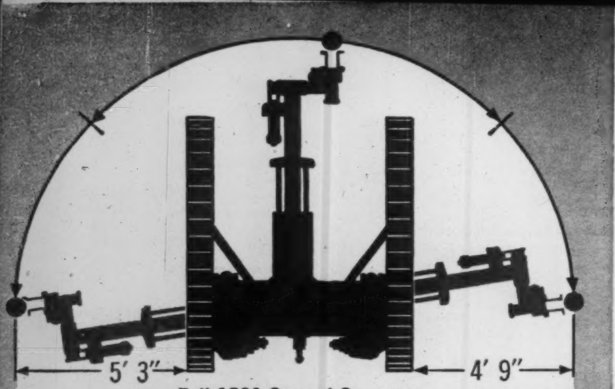
PLYMOUTH® LOCOMOTIVES

WITH TORQOMOTIVE DRIVE

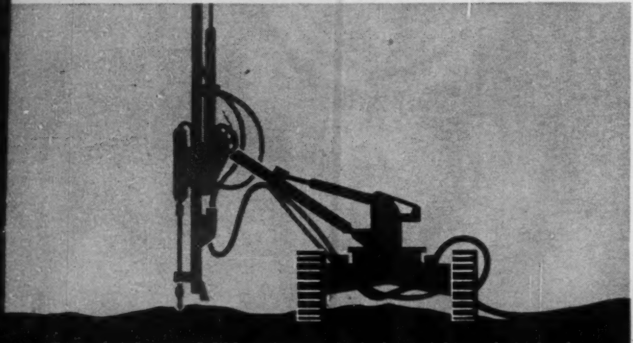
PLYMOUTH LOCOMOTIVES in Progressive Industry throughout the world

CIRCLE 133 ON READER SERVICE CARD

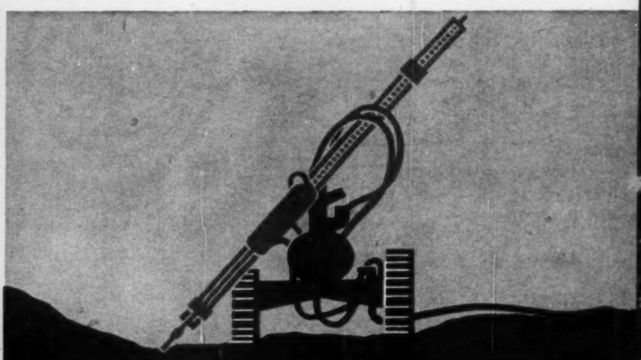
UNBEATABLE



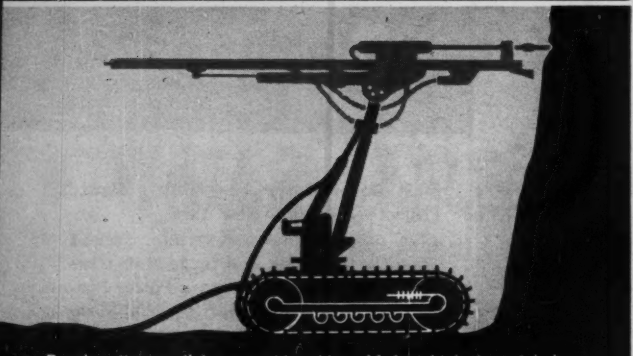
Full 180° Ground Coverage.



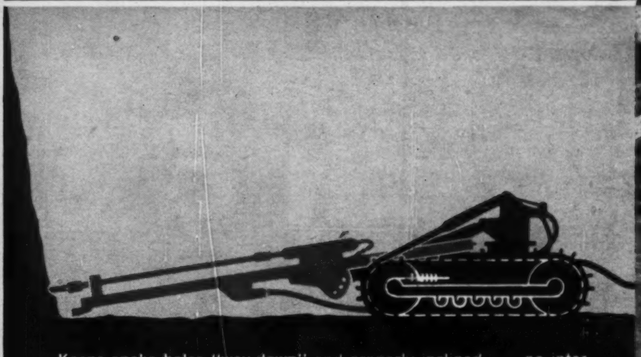
Right or left, new G-900 drills true verticals at right angle to tracks . . . boom swing covers full 180°.



Big 85° carriage swing compensates for steeply sloped conditions.



Reaches "way-up" for record-breaking, 11 foot high, breast holes. The G-900 has no equals for drill pattern coverage.

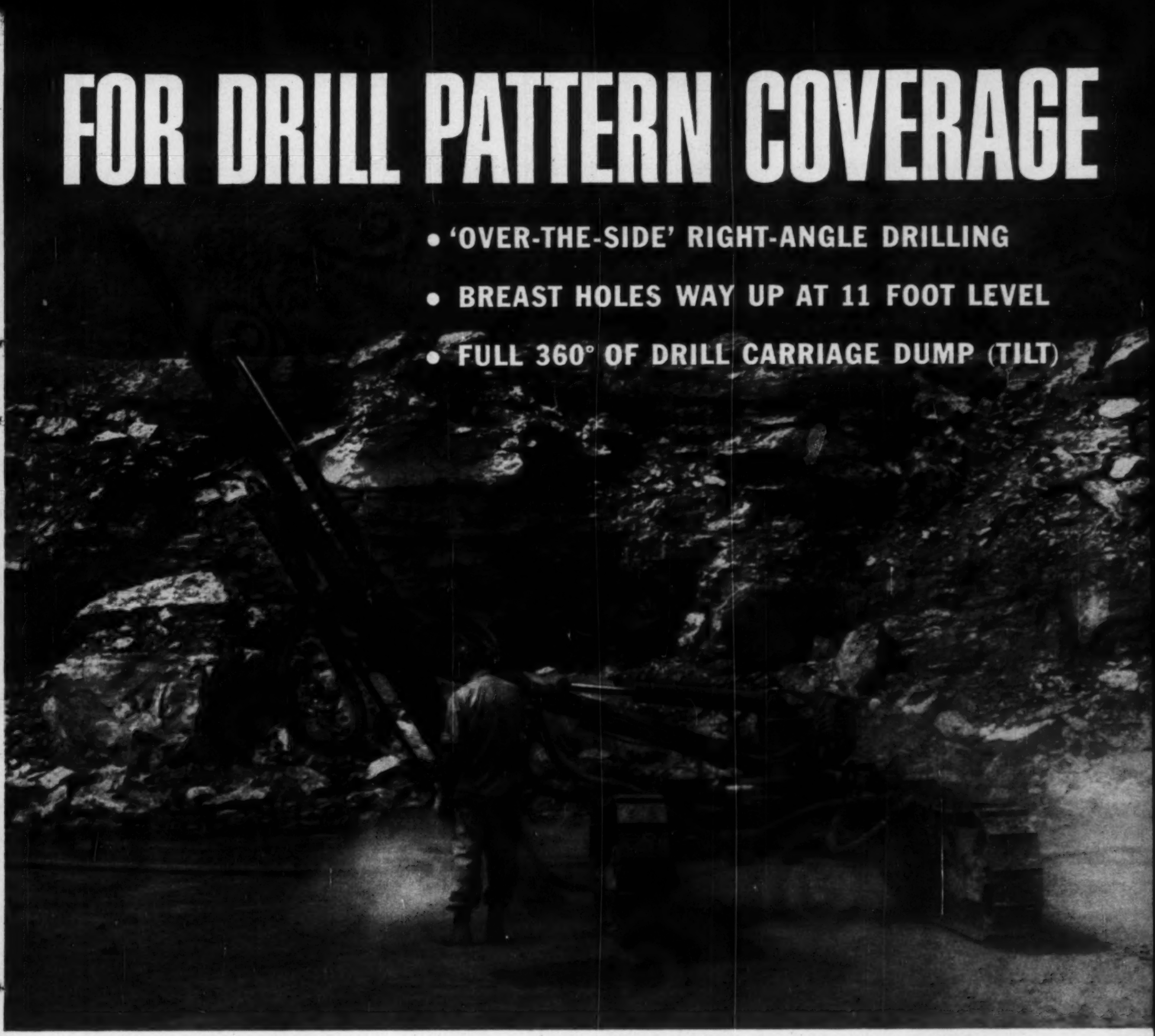


Keeps snake holes "way-down" and properly inclined . . . no interference from feed motors or crawler carriage structural members.

IT'S ALL NEW...TODAY'S MOST ADVANCED CRAWLER-MOUNTED DRILLING UNIT, G-900 TRACDRIL!

FOR DRILL PATTERN COVERAGE

- 'OVER-THE-SIDE' RIGHT-ANGLE DRILLING
- BREAST HOLES WAY UP AT 11 FOOT LEVEL
- FULL 360° OF DRILL CARRIAGE DUMP (TILT)



Unmatched versatility . . . drill boom is swung at right angles to tracks and drill carriage tilted inward for steeply sloped conditions.

Out of a wealth of field experience and five years of intensive research Chicago Pneumatic brings you a self-propelled drilling unit that experts are calling "the driller's drill" . . . it's maneuverable, rugged and productive. With a horizontal boom swing of 180° the new G-900 gives the driller an extra large drilling radius. Dual controls on turret and boom end give the driller quick, accurate positioning of boom and drill carriage for every job. Solid footing on any ground is assured by extra-long crawlers, providing 675 square inches of ground contact per track. Husky power from its 12 hp. tramming team, combined with velvet smooth handling, give the G-900 faster spotting and easier sinking of true holes than any comparable rig.

With the sensational 4-1/2" Deep Hole Drill it quickly sinks 3" holes up to 75 feet.

THESE 6 MAJOR ADVANTAGES ARE CP TRACDRIL EXCLUSIVES

1. **"Boarding house reach"** lets the drill carriage stretch out 63" beyond tracks to drill true verticals alongside the unit.

2. **Extra-long Oliver tracks,** specially designed, provide stabilizing ground contact of 1350 square inches.

3. **Sure-footedness and maximum traction** are assured with five lower track wheels.

4. **Seven labor-saving hydraulic cylinders** ease driller's muscle work, give fluid-smooth action.

5. **Two sets of grouped controls,** at turret and boom end, save time and steps for driller, boost footage.

6. **"Dead man" automatic brakes** that slam on when tramming throttle is closed, locking unit on steepest slopes or bad ground.

To get a copy of the new bulletin giving full specifications and details on the new G-900 Tracdril, write for SP-3627 to: *Chicago Pneumatic Tool Company, 8 East 44th Street, New York 17, N. Y.*

Chicago Pneumatic 8 East 44th Street, New York 17, N. Y.

AIR COMPRESSORS • PNEUMATIC AND ELECTRIC TOOLS • AIR-BLAST BITS • DIAMOND DRILLS • REICHdrills • ROCK DRILLS

CIRCLE 135 ON READER SERVICE CARD

Stockpiling and reclaiming materials

A 28-page catalog describes and illustrates DragScraper storage and reclamation of many materials—cement clinker, gravel, crushed rock, etc. Sauerman Bros. Inc. **505**

Electron beam welding

Precision welding with an electronic beam gun, which heats and fuses metals by direct bombardment with highly accelerated electrons, is described in a 12-page illustrated catalog. Air Reduction Co., Inc. **506**

Arc welding

Vest pocket guide to better welds contains 80 pages of information on proper welding procedures, operator qualifications, metal identification and other data on arc welding. Hobart Brothers Co. **507**

Small pipe welding

Four-page bulletin, contains data on electrode size, required current, welding time, etc., for contractors concerned with welding small-diameter non-critical pipe. Lincoln Electric Co. **508**

Fallout shelters

A 16-page booklet presents five plans for clay masonry fallout shelters for installation in a private home. Structural Clay Products Institute. **509**

Fire control

A chart shows detailed information on fire extinguishers and Class A, B, and C, fires. Walter Kidde & Co. **510**

Spray mulch

A spray mulch for use along highways and landscapes to control soil erosion and speed seed germination is described in a four-color folder. Alco Oil & Chemical Corp. **511**

Steel weight tables

Compact, 72-page booklet contains weight tables of round, square, hexagon, octagon and flat steel bars. Included are math tables and formulae. Jos. Dyson & Sons, Inc. **512**

Miscellaneous

Mobile office

An illustrated leaflet describes the construction and equipment of a trailer office that can be towed from site to site. Wells Cargo, Inc., Division of Prairie Schooner, Inc. **513**

Trucking service

A transportation company that specializes in shipment of heavy and bulky articles explains its services in a 16-page pamphlet. U.S.A.C. Transport, Inc. **514**

Mobile lubrication equipment

A line of equipment and accessories for mobile lubrication rigs is described and illustrated in a 24-page catalog. Lincoln Engineering Co. **515**

Mobile lubrication equipment

Design and assembly instructions for a mobile lubrication unit make up a heavily illustrated, 32-page manual. Lincoln Engineering Co. **516**

Truck scales

A line of portable truck scales for contractors, road builders and material handlers is described in a six-page folder. Cardinal Scale Manufacturing Co. **517**

Computers

A six-page folder explains how to solve a quadratic equation with the DE-60 computer. Clary Corp. **518**

Data processing

Functions and operations of an electronic data processing center set up for clients in engineering, business and industry are described in a 12-page brochure. McDonnell Aircraft. **519**

Soil density tester

An instrument designed to simplify inplace density tests of soils and construction materials is described in a two-page flier. Soiltest, Inc. **520**

Lighting calculator

The Wasco Daylighting Calculator, a sliderule-like tool, helps designers to find the required size, type, number and spacing of Wasco skydomes. Wasco Products. **521**

School signals

Bulletin explains a school signal system with an exclusive electronic controller. Crouse-Hinds Co. **522**

Signs

An extensive line of standard signs and their accessories for streets and highways is illustrated in a 24-page catalog. Miro-Flex Company, Inc. **523**

Safety lights

A bulletin includes specifications, dimensions and suggestions for protective use of flasher safety light standards. R. D. Fageol Co. **524**

For More Information . . .

. . . Select the publications you want and circle the key numbers (shown at the end of each item) on the inquiry card at the end of this section.

Reflector beads

The use of minute glass beads with paint to make reflectorized traffic markings is explained. Specifications and price lists are included in this ten-page booklet. Microbeads, Inc. **525**

Rust inhibitor

A compound that inhibits rust and corrosion in heavy-duty equipment cooling systems is presented in an eight-page brochure. Lubrication Engineers, Inc. **526**

Pipe repair clamps

Four-page folder describes one and two-piece clamps with integral neoprene sealing faces suitable for pipe leak repairs over a full range of diameters and clamp lengths. Adams Pipe Repair Products. **527**

Pipe repair equipment

Two leaflets describe a line of full-circle clamp couplings for repairing cast-iron, asbestos-cement or steel pipe of all sizes; and a clamp and gasket method of repairing leaks. Smith-Blair, Inc. **528**

Rod wiper seal

A combination of rod wiper and rod scraper in a single unit that protects reciprocating shafts and hydraulic cylinders exposed to dirt conditions is described in a four-page catalog. Chicago Rawhide Manufacturing Co. **529**

Wire and Accessories

Tie-wire reels, wire coils and belts that eliminate carrying over-shoulder coils are described in eight-page bulletin. Ideal Reel Co. **530**

Wire rope

A 156-page illustrated catalog contains recommendations for use of wire ropes on various types of construction machinery and basic wire rope information. Bethlehem Steel Co. **531**

Wire rope

The correct uses of wire rope and slings are explained and illustrated in a 26-page booklet. Directions for reeving loads socketing and clamping cable are given. Also included are cross-sectional drawings of standard wire ropes and tables of sizes and strengths. Union Wire Rope Corp. **532**

Socket-head cap screws

Folder and data table provides information on a new series and comparison data with early design socket-head screws as well as listing of many other standard Stanscrew products. Standard Screw Company. **533**

Information Service Center

How You Can Get More Information

Here's the easy way to get copies of manufacturers' publications, editorial reprints and more information about products and services advertised in ENR.

Manufacturers' publications items are selected by ENR editors for their reader interest. Often these items offer detailed descriptions of products already introduced to readers in ENR's New Products Department. The information service card on this page thus gives you a second opportunity to catch up with products that are now available.

ENR editorial reprints, available free, include technical and business articles, special reports, annual surveys, check lists of the right way to do things and stories on successful products, methods and men.

Editorial reprints are also available via the inquiry card. Single copies are free; for quantity rates, write Information Service Center, ENGINEERING NEWS-RECORD, c/o University of Pennsylvania, Post Office Box 7649, Philadelphia 4, Pennsylvania.

How It Works . . .

1. Circle number on card corresponding to key number of the publication, ad or reprint you're interested in.
2. Fill out the spaces on the bottom for name, position, address, etc.
3. Drop the card in the mail. We'll do the rest.

Fast Service . . .

The information service card is designed to get you what you want to know quickly and easily. There are two of them: One for you; one for a friend or business associate who may read your copy.

FIRST CLASS
PERMIT NO. 23037
PHILADELPHIA, PA.

BUSINESS REPLY MAIL
No Postage Necessary if Mailed in the United States

POSTAGE WILL BE PAID BY

ENGINEERING NEWS-RECORD
% University of Pennsylvania
P.O. Box 7649
Philadelphia 4, Pa.
Information Service Center

Circle Key Number and Print Name on Coupon *(Good until Nov. 15, 1960)*

ADVERTISED PRODUCTS:						INSIDE FRONT COVER						INSIDE BACK COVER					BACK COVER		
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
101	102	103	104	105	106	107	108	109	110	111	112	113	114	115	116	117	118	119	120
121	122	123	124	125	126	127	128	129	130	131	132	133	134	135	136	137	138	139	140
141	142	143	144	145	146	147	148	149	150	151	152	153	154	155	156	157	158	159	160
161	162	163	164	165	166	167	168	169	170	171	172	173	174	175	176	177	178	179	180
181	182	183	184	185	186	187	188	189	190	191	192	193	194	195	196	197	198	199	200
201	202	203	204	205	206	207	208	209	210	211	212	213	214	215	216	217	218	219	220
221	222	223	224	225	226	227	228	229	230	231	232	233	234	235	236	237	238	239	240
241	242	243	244	245	246	247	248	249	250	251	252	253	254	255	256	257	258	259	260
MANUFACTURERS' PUBLICATIONS:										301	302	303	304	305	306	307	308	309	310
311	312	313	314	315	316	317	318	319	320	321	322	323	324	325	326	327	328	329	330
331	332	333	334	335	336	337	338	339	340	341	342	343	344	345	346	347	348	349	350
351	352	353	354	355	356	357	358	359	360	361	362	363	364	365	366	367	368	369	370
371	372	373	374	375	376	377	378	379	380	381	382	383	384	385	386	387	388	389	390
391	392	393	394	395	396	397	398	399	400	401	402	403	404	405	406	407	408	409	410
411	412	413	414	415	416	417	418	419	420	421	422	423	424	425	426	427	428	429	430
431	432	433	434	435	436	437	438	439	440	441	442	443	444	445	446	447	448	449	450
451	452	453	454	455	456	457	458	459	460	461	462	463	464	465	466	467	468	469	470
471	472	473	474	475	476	477	478	479	480	481	482	483	484	485	486	487	488	489	490
491	492	493	494	495	496	497	498	499	500	501	502	503	504	505	506	507	508	509	510
511	512	513	514	515	516	517	518	519	520	521	522	523	524	525	526	527	528	529	530
531	532	533	534	535	536	537	538	539	540	541	542	543	544	545	546	547	548	549	550
EDITORIAL REPRINTS:					601	602	603	604	605	606	607	608	609	610	611	612	613	614	615

NAME ____________________ POSITION ____________________

COMPANY ____________________

BUSINESS ADDRESS ____________________

CITY ____________________ ZONE __________ STATE __________

Did You Miss Any of These Top Articles?

You can order free reprints of the ENR articles below. It's a good chance to catch up on what you missed, get a file copy, or pass one along to an associate. Just circle the numbers on the inquiry card that correspond to the articles you want. Single copies are free as long as they last. Write for quantity prices.

601. What's Right With the Interstate—A fact sheet in defense of the U. S.'s most important building job.

602. College Construction Booms—A 23-page special report on a billion-dollar-a-year market for builders.

603. **The Top Contractors of 1959**—Facts and figures on the biggest in the business.

604. **Highways vs. the City**—A report on the need for cooperation between highway engineers and city planners—and an analysis of how one city solved the problem.

605. **Automatic Jacks Raise Record Lift Slabs**—It took accepted methods plus a few innovations to lift 15 slabs.

606. **Chesapeake Bay Dream Comes True**—This 17½-mile bridge-tunnel crossing will be among the major going projects of the next few years.

607. **Ahead of the Shield Under Boston's Harbor**—The contractor is "shoving blind" through clay with methods unusual for underwater tunnels.

608. **Canada's Biggest Earthfill Goes Year 'Round**—They proved some important points about cold-weather work on the South Saskatchewan River Dam.

609. **The Campaign and Construction**—In addition to the other important issues, the presidential campaign has a special meaning to you as a construction man.

610. **Glen Canyon's Big Pour Starts**—A report on the greatest concreting effort under way anywhere in the world.

611. **What you Should Know About Computers**—Special 13-page report designed to answer all the basic questions.

612. **Big Power for Pushing Scrapers Pays Off**—It costs money, but it makes more. Here's how.

613. **Are We Afraid of High Buttress Dams?**—If not, how come none have been built here?

Circle Key Number and Print Name on Coupon *(Good until Nov. 15, 1960)*

ADVERTISED PRODUCTS:						INSIDE FRONT COVER						INSIDE BACK COVER					BACK COVER		
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
101	102	103	104	105	106	107	108	109	110	111	112	113	114	115	116	117	118	119	120
121	122	123	124	125	126	127	128	129	130	131	132	133	134	135	136	137	138	139	140
141	142	143	144	145	146	147	148	149	150	151	152	153	154	155	156	157	158	159	160
161	162	163	164	165	166	167	168	169	170	171	172	173	174	175	176	177	178	179	180
181	182	183	184	185	186	187	188	189	190	191	192	193	194	195	196	197	198	199	200
201	202	203	204	205	206	207	208	209	210	211	212	213	214	215	216	217	218	219	220
221	222	223	224	225	226	227	228	229	230	231	232	233	234	235	236	237	238	239	240
241	242	243	244	245	246	247	248	249	250	251	252	253	254	255	256	257	258	259	260
MANUFACTURERS' PUBLICATIONS:										301	302	303	304	305	306	307	308	309	310
311	312	313	314	315	316	317	318	319	320	321	322	323	324	325	326	327	328	329	330
331	332	333	334	335	336	337	338	339	340	341	342	343	344	345	346	347	348	349	350
351	352	353	354	355	356	357	358	359	360	361	362	363	364	365	366	367	368	369	370
371	372	373	374	375	376	377	378	379	380	381	382	383	384	385	386	387	388	389	390
391	392	393	394	395	396	397	398	399	400	401	402	403	404	405	406	407	408	409	410
411	412	413	414	415	416	417	418	419	420	421	422	423	424	425	426	427	428	429	430
431	432	433	434	435	436	437	438	439	440	441	442	443	444	445	446	447	448	449	450
451	452	453	454	455	456	457	458	459	460	461	462	463	464	465	466	467	468	469	470
471	472	473	474	475	476	477	478	479	480	481	482	483	484	485	486	487	488	489	490
491	492	493	494	495	496	497	498	499	500	501	502	503	504	505	506	507	508	509	510
511	512	513	514	515	516	517	518	519	520	521	522	523	524	525	526	527	528	529	530
531	532	533	534	535	536	537	538	539	540	541	542	543	544	545	546	547	548	549	550
EDITORIAL REPRINTS:					601	602	603	604	605	606	607	608	609	610	611	612	613	614	615

NAME ______________________ POSITION ______________________

COMPANY ______________________

BUSINESS ADDRESS ______________________

CITY ______________________ ZONE __________ STATE ______________________

FIRST CLASS
PERMIT NO. 23037
PHILADELPHIA, PA.

BUSINESS REPLY MAIL
No Postage Necessary if Mailed in the United States

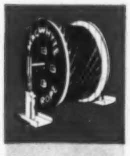
POSTAGE WILL BE PAID BY

ENGINEERING NEWS-RECORD
℅ University of Pennsylvania
P.O. Box 7649
Philadelphia 4, Pa.
Information Service Center

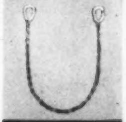
★ ★ ★

All-Americans for a Winning Materials Handling Team

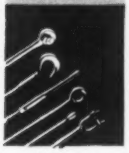
These three championship performers give you a materials handling team that is unbeatable ... All-American from the basic steel — through the drawing of the wire — to the finished wire rope product.



All-American No. 1 — Whyte Strand Wire Rope. Inspires other members of your team, brings out the best in them for maximum production at lowest cost. (Write for bulletin 6025.)



All-American No. 2 — The Atlas Sling for the safety spot — lifting and carrying all kinds of loads. Flexible, braided construction provides constant championship performance with unquestioned safety. (Write for bulletin 5308.)



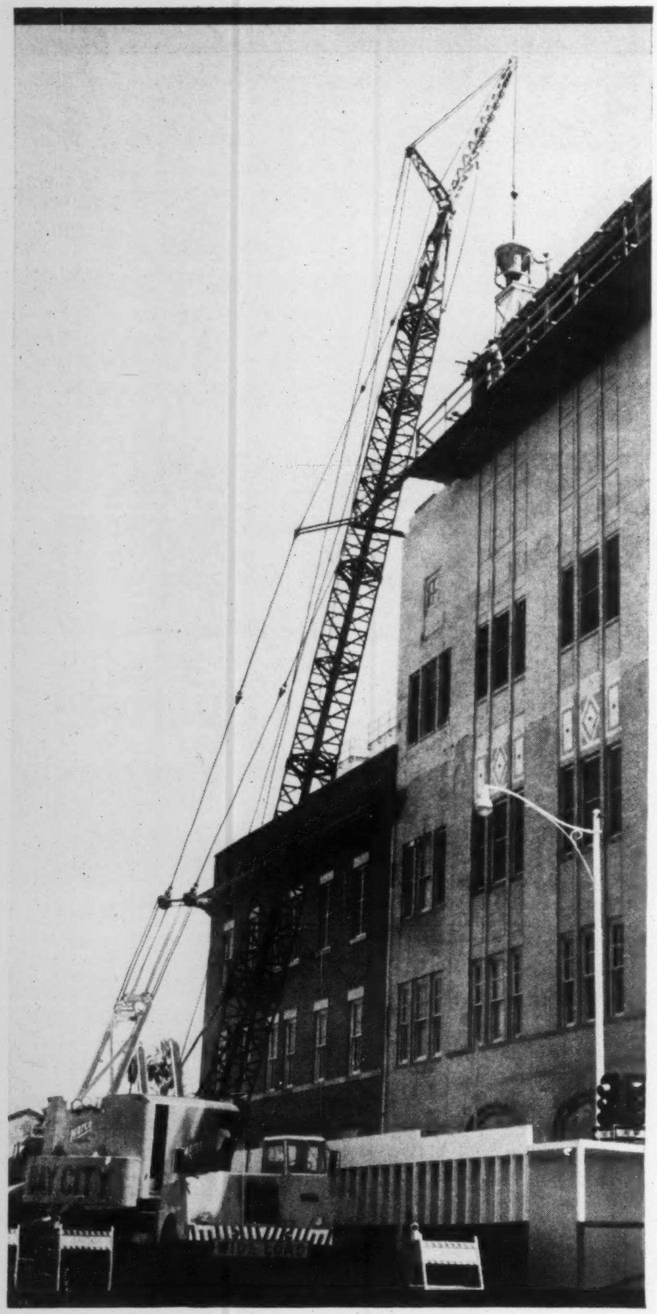
All-American No. 3 — Macwhyte Safe-Lock Cable Assemblies are a triple-threat specializing in uniformity, appearance, and agility ... for manufactured products and equipment components requiring the positive performance of a custom-made cable assembly. (Write for bulletin 5601.)

In addition to their outstanding performance on the materials handling and production fields, each one of these All-Americans lives up to these championship qualifications: *Dependability* that is the result of constant uniformity, maintained by rigid quality controls at every step of manufacture. *Experience* that pays off in high production scores ... and game-winning play with other members of your equipment team specializing in American rules of the game. *Availability* guarantees the right player for every play, whether at the factory or the warehouse ... backed up by expert engineering service. *These All-American products are completely made in the U. S. A.*

Start now to build up your All-American materials handling team. Your Macwhyte representative will be glad to coach your selections.

MACWHYTE *Wire Rope* COMPANY

CRANEMOBILE®



"...so swift, so sure, so safe in operation that many of our customers demand it's use."

MARCO EQUIPMENT CO.,
CONTRACTOR'S EQUIPMENT RENTAL,
PHOENIX, ARIZONA

You'll hear this sort of thing from many more **CRANEMOBILE** owners who are in the crane rental business, and here's why . . .

Control - of - the - load operation with special **CRANEMOBILE** load lowering device. Provides accurate POSITIVE control in the lowering of heavy loads. When engaged, this device **automatically** lowers the load, without using brake, at varying speeds.

Pin-point load maneuvering with **CRANEMOBILE** power-controlled independent boom hoist. Here's a **true** erector's boom hoist — the operator has precise control of boom alone, or boom and load, at all times.

Big brakes, sturdy clutches, and large cable drums. **CRANEMOBILE** brake and clutch flanges have large contact areas for superior control, superior operation. **BAY CITY** tandem drum arrangement assures ample cable capacity for long boom jobs.

CRANEMOBILES are available in 25-, 30-, 35-, and 40-ton sizes . . . are mounted on specially designed **BAY CITY**-built 6x4 or 8x4 carriers. For detailed information and the name of your nearest dealer, write today.

BAY CITY **SHOVELS, INC.**
BAY CITY, MICHIGAN

a subsidiary of Unit Crane & Shovel Corp.

←CIRCLE 61 ON READER SERVICE CARD

CIRCLE 62 ON READER SERVICE CARD

Full Compliance Not Required

Law develops a doctrine of substantial performance in determining right to recover full contract price

Literal compliance with a building contract is not essential to a recovery on the contract. If the contractor has substantially performed the contract, he can recover the contract price, less the cost of remedying the contractor's defects and omissions.

The rule was followed in a federal case, for example, where a contractor sued to recover a balance due under a contract to construct a building. The owner's defense was that there were material defects in the work.

The contractor obtained a judgment, but the appellate court[1] directed that a new trial be had since the evidence showed that part of the work performed by the contractor did not conform with the specifications and that the owner was entitled to deduct from the money due the contractor the cost of remedying the defects in the work.

The owner claimed that performance by the contractor was insufficient to permit a recovery for the work. As to this phase of the litigation, the appellate court stated: "The law is settled in Oklahoma that when a contractor and builder has in good faith endeavored to comply with the terms of the contract, literal compliance in all details is not essential to recovery, especially where the owner has taken possession of the building. In Robinson v. Beaty, 75 Okl. 69, 181 P. 941, 942, the Oklahoma Supreme Court said: 'Since the rule of exact or literal performance has been relaxed, literal compliance with a building contract is not essential to a recovery thereon, but a performance thereof in all its material and substantial particulars is sufficient.'

"There is substantial performance when the builder has in good faith intended to perform his part of the contract and has done so in the sense that the building is substantially what is provided for, and there are no omissions or deviations from the general plan which cannot be remedied without difficulty. 3 Williston, Contracts, Section 842 (Rev. Ed. 1936; Restatement, Contracts, Section 275; 9 American Jurisprudence, Building and Construction Contracts, Section 42, Vol. 40, Words and Phrases, Substantial Performance.

"Where there has been substantial performance, the measure of recovery is the amount stipulated in the agreement less the reasonable cost of remedying defects and omissions to make the building conform to the contract. Klein v. Moore, 202 Okl. 88, 210 P. 2d 363; Busboom v. Smith, 199 Okl. 688, 191 P. 2d 198, and cases there cited. In Lane v. F. S. Miller Lumber Co., 101 Okl. 14, 222 P. 968, 969, the court quoted with approval from Kelley v. Hamilton, 78 Okl. 179, 189 P. 535, as follows: 'A contractor and builder who has in good faith endeavored to perform all that is required of him by the terms of his contract for the construction of a building, and has in fact substantially performed the same, is ordinarily entitled to sue upon his contract and recover the contract price less proper deductions therefrom on account of omissions, deviations, and defects chargeable to him, especially where the owner occupies and uses such building.'

"See also 9 Am. Jur., Building and Construction Contracts, sections 40, 43; Annotation 38 A.L.R. 1383; Annotation 65 A.L.R. 1297."

The above rule, where performance failures are not material, is not confined to Oklahoma but prevails in practically all states.

The above action was brought to foreclose a mechanic's lien and under Oklahoma law, the contractor may also recover attorney's fee.

(1) Kizziar v. Dollar, 268 F. 2d 914, U. S. Court of Appeals, July 23, 1959.

Who Owns an Architect's Plans?

Architect's plans belong to the owner and not to the architect, unless there is an agreement to the contrary.

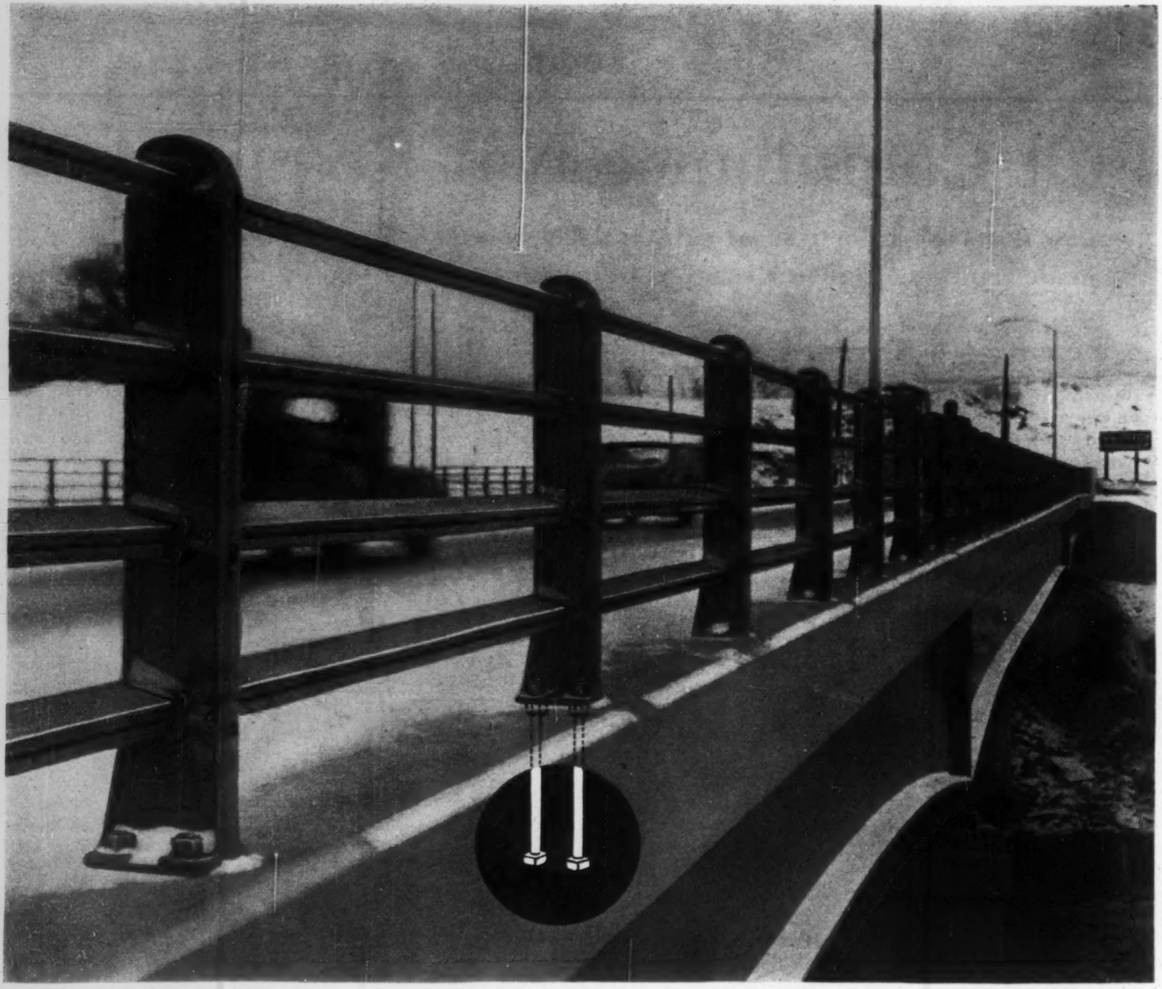
Ownership of such plans was discussed in the following New York case, where the owner was allowed to make multiple use of the plans without further compensation to the architect:

Leonard Little employed George E. Tumey, an architect, to prepare plans for a three-bedroom house. The services were performed and paid for. Little turned the plans over to a third party who erected several houses in accordance with the plans. The architect then brought an action against Little and the other party for additional compensation for the services rendered. The action was dismissed, the court holding that the filing of the plans with the building department constitutes a publication terminating such common-law copyright the architect might have had.[1]

The court stated: "Plaintiff's (architect's) claim is foreclosed by Wright v. Eisle, 86 App. 356, 83 N.Y.S. 887, in which the Second Department upheld dismissal of plaintiff's complaint in just such a case as this on the ground that the filing of an architect's plans with the building department constitutes a publication terminating such common law copyright as he may have had, and that the property in the plans was in any event in the client for whom they were prepared rather than the architect. See also, Hill v. Sheffield, Sup., 117 N.Y.S. 99; 6 C.J.S. Architects, Sec. 10, page 303.

"In the absence of a contrary agreement, the client, not the architect is the owner of the plans. McCoy v. Grant, 144 Minn. 92, 174 N.W. 728, cited by plaintiff, is not contrary, for it recognized that 'one who employs an architect to devise and prepare plans and specifications for a building and pays him therefor becomes the owner of such plans and specifications unless the contract provides that they are not to become his property.' The court in that case found that property in the plans had been specifically reserved by the architect. That is not so here. Plaintiff urges that he reserved property in the plans because he did not turn over to defendant Leonard Little the tracings, but delivered only blueprints. He says that he told Little that he would not turn the tracings over to him because his architect's seal was on the tracings and that Little did not advise him that he intended to build more than one house, but this is not sufficient to spell out a contract arrangement reversing the usual rule."

(1) Tumey v. Little, 186 N.Y.S. 2d 94, Supreme Court, Nassau County, New York, April 7, 1959.



Warning:

BRIDGE RAIL IS ONLY AS STRONG AS ITS ANCHOR BOLTS!

When anchoring fasteners are not large enough, the strength of bridge rail is seriously weakened. Failure can result. Make sure you're using anchor bolts of sufficient size and strength.

Here's how to choose the correct size of bolt:

For Bethlehem Perfect Vision Bridge Rail—1 or 2 rail posts—use galvanized 1-in. anchor bolts.

For Bethlehem Perfect Vision Bridge Rail—3 or 4 rail posts—use galvanized 1¼-in. anchor bolts.

Another important benefit from using anchor bolts of the right size and quality is the elimination of the need for concrete replacement. Inadequate anchor bolts tend to shear off under heavy impact. When this happens, it's costly to remove and reset the concrete base.

Strong Bethlehem anchor bolts are made specially for use with Bethlehem Perfect Vision Bridge Rail. Avoid weak or brittle bolts. Order to ASTM Specification A-307.

The nearest Bethlehem sales office can help you in selecting the right bridge rail *and* the right anchor bolts.

Steel

For strength
... economy
... versatility

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.
Export Distributor: Bethlehem Steel Export Corporation

BETHLEHEM STEEL

BETHLEHEM STEEL

Fraud Presents Two Choices

One who seeks to rescind a contract on the grounds that he was induced to enter into it in reliance on fraudulent representations must act without delay after discovering the fraud.

In a New Jersey case, the purchaser of stock in a bankrupt corporation sought to recover for the stock, contending that he was induced to purchase the stock by fraud.

The claim was made about two years after evidence of the fraud was discovered. The court[1] denied the relief on the ground that the party did not act with diligence in seeking relief after the discovery of the fraud.

The court, quoting from another case,[2] stated: "A party entitled to rescission on the ground of fraud may either avoid the transaction or confirm it; he cannot do both; and once he elects, he must abide by his decision. When he has discovered the fraud, or has been informed of facts and circumstances from which such knowledge would be imputed to him, he must thereupon act with diligence and without delay if he desires to rescind; and the transaction will be deemed ratified if he does any material act which assumes the transaction is valid. His continued dealing with the property purchased, after knowledge of the fraud, as if the contract were subsisting and binding, is evidence of an election to treat the contract as valid; so, also, is the payment after such knowledge." Many cases are cited to sustain this principle of law.

While the above case did not involve a construction contract, the same rule applies. In many cases, construction contracts are entered into in reliance on false representation as to the conditions to be encountered in the performance of the work, and such false representations are not discovered until much of the work has been performed. In such cases the contractor generally brings an action to recover the increased cost of the work resulting from the false representations. In one case, the contractor did not discover the false representations until the work was completed and then brought an action to rescind the contract and to recover on the basis of the fair and reasonable value of the work performed and obtained a recovery.

(1) **In Re Vandersee Corp., 173 F. Supp. 217, U. S. District Court of New Jersey, May 27, 1959.**

(2) **Ajamian v. Schlanger, 20 N.J. Super. 216, at page 249, 89 A. 2d 702, 704.**

Lien Depends on Valid Debt

Where nothing is due a general contractor at the time a contract is canceled, there is nothing to which liens of subcontractors can attach.

The rule was applied in a New York case in which Robert Wolfe entered into a contract with Robin Construction Corp., whereby the latter was to construct a residence for the agreed price of $21,588.

The contract provided that: "Should the contractor neglect to execute the work properly or fail to perform any provision of the contract, or fail to continue with the work for a period of ten days, the owner after ten days' written notice to the contractor may without prejudice to any other remedy he may have, make good the deficiencies and may deduct the cost thereof from the final payment due the contractor, or, at his option, may terminate the contract, holding the contractor liable for payments made to that time, take possession of all materials, and finish the work by such means as he sees fit, and if the unpaid balance of the contract price exceeds the expense of finishing the work, such excess shall be adjusted between owner and contractor, but if such expense exceeds such unpaid balance, the contractor shall be liable for the difference to the owner."

The contractor proceeded with the performance of the work as of March 14, 1956 and the owner had paid him the sum of $10,400, which sum exceeded the value of the work done as of that date. On that date, owing to the contractor's failure to continue the work expeditiously, the owner notified the contractor of his election to terminate the contract. The owner thereafter completed the house and the cost of completion plus the amount paid the contractor exceeded the contract price.

Thereafter, several subcontractors filed mechanics liens, all of which were dismissed, the court[1] holding that since there was nothing owing the contractor, there was nothing to which a lien could attach.

Under the statutory theory of some states, money due a contractor represents a trust fund for the payment of subcontractors and materialmen.

(1) **Maycumber et al. v. Wolfe, 171 N.Y.S. 2d 44, N.Y. Supreme Court.**

stop

FACTS YOU SHOULD KNOW
ABOUT WALJOHN WATERSTOP

Check these 9 Points...
and then Specify
WALJOHN WATERSTOP

DO YOU KNOW?

1. WALJOHN PVC* Waterstops are proved to be 100% watertight.
2. WALJOHN PVC* Waterstops are virtually indestructible.
3. WALJOHN PVC* Waterstops are unaffected by their environment.
4. WALJOHN PVC* Waterstops are simpler to install than conventional metal or rubber waterstops.
5. WALJOHN PVC* Waterstops are manufactured in acccordance with U.S. Army Corps of Engineers Tentative Works Guide CE. #1402 and Ontario, Canada, Hydro-Electric Commission C-245-55.
6. WALJOHN PVC* Waterstops are joint-fused thermostatically by a specially made heat unit supplied by the Waljohn Company.
7. WALJOHN PVC* Waterstops are made in every shape and profile required in a PVC Waterstop.
8. WALJOHN PVC* Waterstops are prime-manufactured by the Waljohn Company in their own plant and certified to rigid specifications by one of America's oldest testing companies, The U.S. Testing Co., Inc..
9. WALJOHN PVC* Waterstops are being installed or have already been installed in every state in the Union in all types of construction.

An ample listing of installations is yours upon request.

WALJOHN WATERSTOP INC.
400 88th Street, B'klyn 9, N. Y.
SHORE ROAD 8-0300

Please send me your FREE Illustrated Brochure, List of Installations, Profile Sheet and Samples.

Name of Firm ____________

Street ____________

City ____________ Zone ____ State ____

***PVC is Plastic**

Sears Roebuck Warehouse, Moline, Illinois, constructed with nineteen 42' 3" Rilco laminated wood bowstring trusses in tandem, spaced 24' 6" o.c. Contractor: Tunnicliff-MacDonald, Davenport, Iowa. Architect: M. R. Beckstrom, Moline, Illinois.

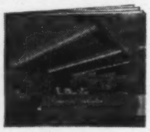
Contractor Saves up to $100 On Each Rilco Bowstring Truss

Savings of up to $100 on each Rilco prefabricated bowstring truss were reported by Carl Stephens, General Superintendent, Tunnicliff-MacDonald, Davenport, Iowa, contractor for the new Pioneer Warehouse, Moline, Illinois, leased by Sears Roebuck & Company.

Each Rilco truss was assembled by three men in 1½ hours. Comments Mr. Stephens: "We bought these trusses for approximately $100 less than completely assembled trusses. Our labor cost on assembly and erection for each truss was around $50. We feel there was a savings of $75-$100 each by using Rilco trusses."

Rilco laminated wood structural members offer many construction advantages. Their initial cost is low, maintenance practically nil. Each member is prefabricated to exact specifications for fast erection by regular job crews.

Rilco service engineers will be happy to consult with you, without obligation.



Write for free commercial construction catalog.

RILCO

works wonders with wood

RILCO LAMINATED PRODUCTS
W801 First National Bank Building
St. Paul 1, Minnesota

DISTRICT OFFICES: Tacoma, Washington; Fort Wayne, Indiana; Linden, New Jersey

Numerous Rules Are Used In Construing Contracts

Parties to a contract are bound by the terms of the contract they have made. Courts will not rewrite contracts.

"It is true that if the terms of a contract are ambiguous, any doubt of ambiguity must be construed against the party who wrote it and the true meaning decided by the jury and not the court. Home Builders of Mercer County v. Delwood Corp., 379 Pa. 255, 108 A. 2d 731.

"On the other hand, the interpretation of an agreement which is clear and unambiguous, is for the court. Barium Steel Corp v. Wiley, 379 Pa. 38, 108 A. 2d 336.

"In construing a contract, the agreement must be interpreted as a whole, and their words given their ordinary meaning. Diamond v. Drucker, 177 Pa. Super. 226, 110 A. 2d 820.

"The ordinary meaning of language throughout the country is given to words used in the contract, unless circumstances show that a different meaning is applicable. Hall Motors Sales, Inc., v. Studebaker-Packard Corp., D.C., 145 F. Supp. 430.

"Words in a contract must be given their ordinary meaning. Byrne v. Bushkoff, 177 Pa. Super. 101, 110 A. 2d 813."[1]

Where there is no difficulty in determining from the instrument itself what the intention of the parties is, and where the contract is perfectly clear and unambiguous in its language and provisions, no resort is necessary nor will be made to any of the rules of construction, unless some latent ambiguity is proved.[2]

"The rule is firmly established that the parties are bound by the agreement which they have made. 'The law will not make a better contract for parties than they themselves have seen fit to enter into, or alter it for the benefit of one party and to the detriment of the other. The judicial function of a court of law is to enforce a contract as it is written.' Kupfersmith v. Delaware Insurance Co., 84 N.J.L. 271, 86 A. 399, 45 L.R.A., N.S., 847."[3]

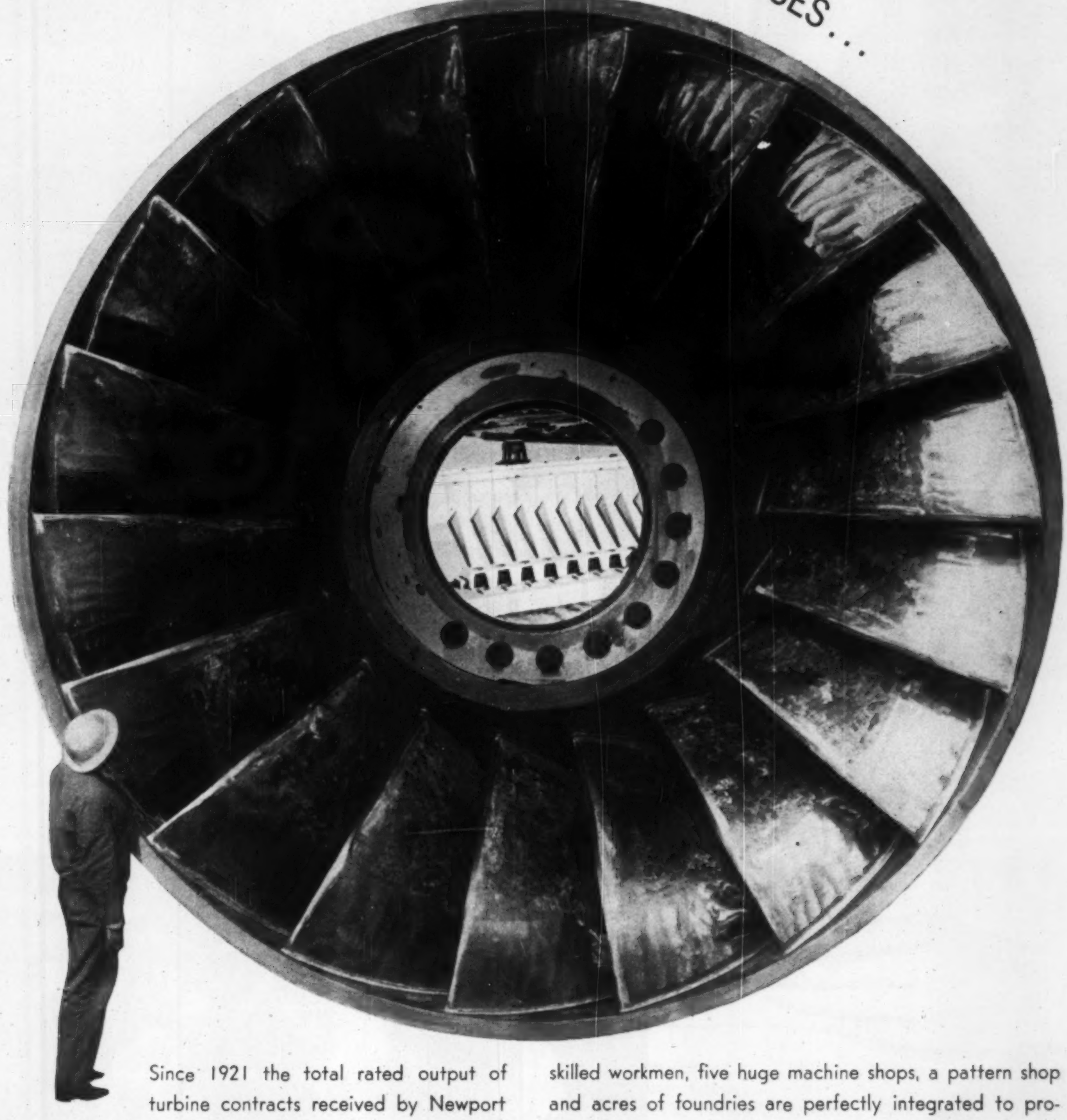
A good rule of thumb for those entering into contracts is to know what they want, say what they mean and understand what they have said.

(1) Pines Plaza Bowling, Inc. v. Rossview, Inc., 145 A. 2d 672.

(2) Briggs v. United Shoe Machinery Corp., 92 N.J. Eq. 277, 114 A. 538, 540.

(3) Leeds and Lippincott v. Nevius, 133 A, 2d 4.

NEWPORT NEWS HARNESSES 12,000,000 HORSES...

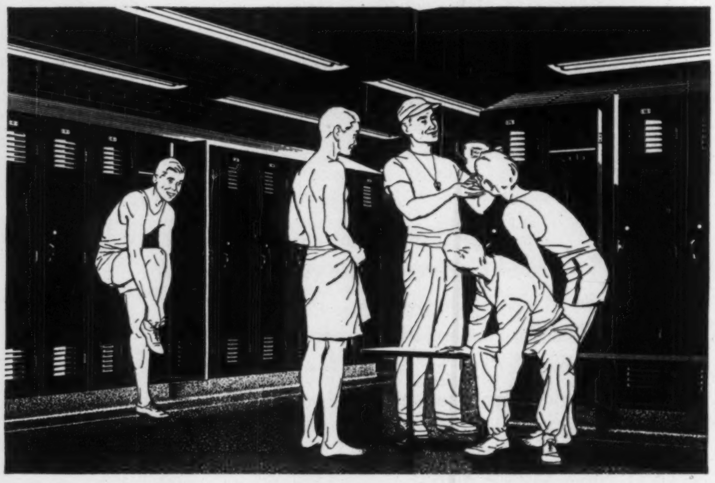


Since 1921 the total rated output of turbine contracts received by Newport News exceeds 12,000,000 horsepower. The Niagara Project, Grand Coulee, Hoover and Chief Joseph are but a few of the installations for which Newport News has designed and built such equipment as hydraulic turbines, valves, gates and penstocks.

Newport News has the men . . . the methods . . . and the machines to take gigantic jobs like these in stride. Large engineering and design staffs, hundreds of highly skilled workmen, five huge machine shops, a pattern shop and acres of foundries are perfectly integrated to produce large units in the shortest possible time . . . from water power equipment to wind tunnels, from cracking towers to paper dryer rolls.

Look to Newport News with its seventy-five years of metal fabricating experience. Your inquiries are invited.

Newport News
SHIPBUILDING AND DRY DOCK CO.
NEWPORT NEWS, VIRGINIA



REPUBLIC STEEL LOCKERS offer school administrators student accepted advantages in service and economy. Big, roomy interiors are designed for student conveniences. Built-in louvers assure free-flow ventilation—keep locker interiors fresh and clean smelling the year 'round. Bonderized. All steel construction — fire proof. Republic will help you with your locker planning, assume full responsibility for complete installation.

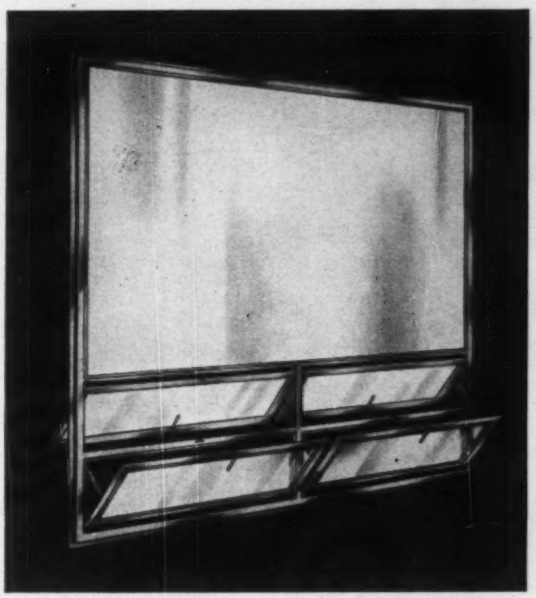
at the head of the class...
TRUSCON *Aluminum Classroom Windows*

Big! Bright! Economical! Truscon Aluminum Windows are at the head of the class in modern school design, construction, and easy maintenance.

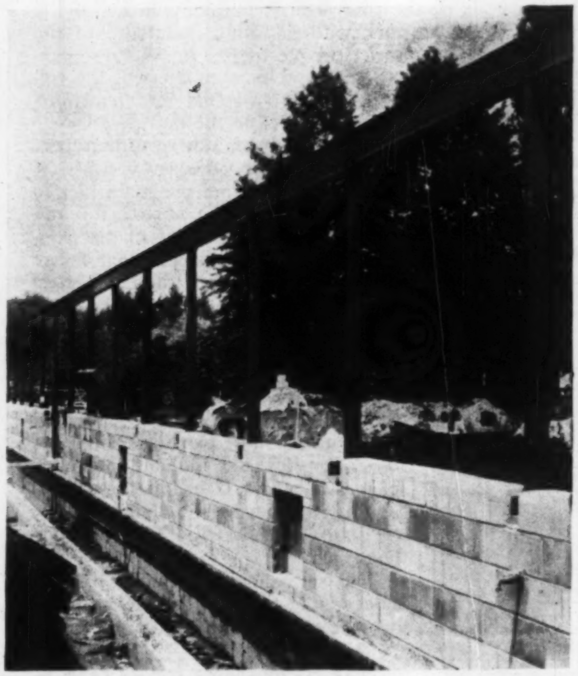
Truscon Aluminum Classroom Windows offer the economy of large glass areas combined with a wide selection of projected ventilator arrangements. Lower in first cost than conventional glass block and ribbon window construction. Lower in maintenance costs with the plus advantage of easy glass replacement.

Truscon Aluminum Classroom Windows are weatherstripped with vinyl plastic around the entire vent perimeter on the inner weathering contact. The unique design of this weatherstripping assures a tight seal, minimum infiltration of air, more comfortable room temperature, and a resultant savings in heating costs. Hardware is polished white bronze, with a selection of cam handles or spring latches. Also available with special removable handle for controlled air conditioning.

Consult your architect. Ask him to check his A.I.A. FILE No. 16-E. Or, call your Republic-Truscon representative for details, specifications, and quotations.



REPUBLIC ELECTRUNITE TUBING, rounds, squares, rectangles, are a building material with unlimited freedom in structural design. Both beautiful and functional. Greater strength, less weight, easy to handle. Smooth, unbroken surfaces resist moisture and corrosion. No sharp corners or bare edges. Easy to join with other structural members. Ask your architect or building contractor to investigate the advantages and economies of ELECTRUNITE Tubing. Write for additional information and specifications.



REPUBLIC STEEL

World's Widest Range
of Standard Steels and Steel Products

REPUBLIC STEEL CORPORATION
DEPT. EN-9843
1441 REPUBLIC BUILDING • CLEVELAND 1, OHIO

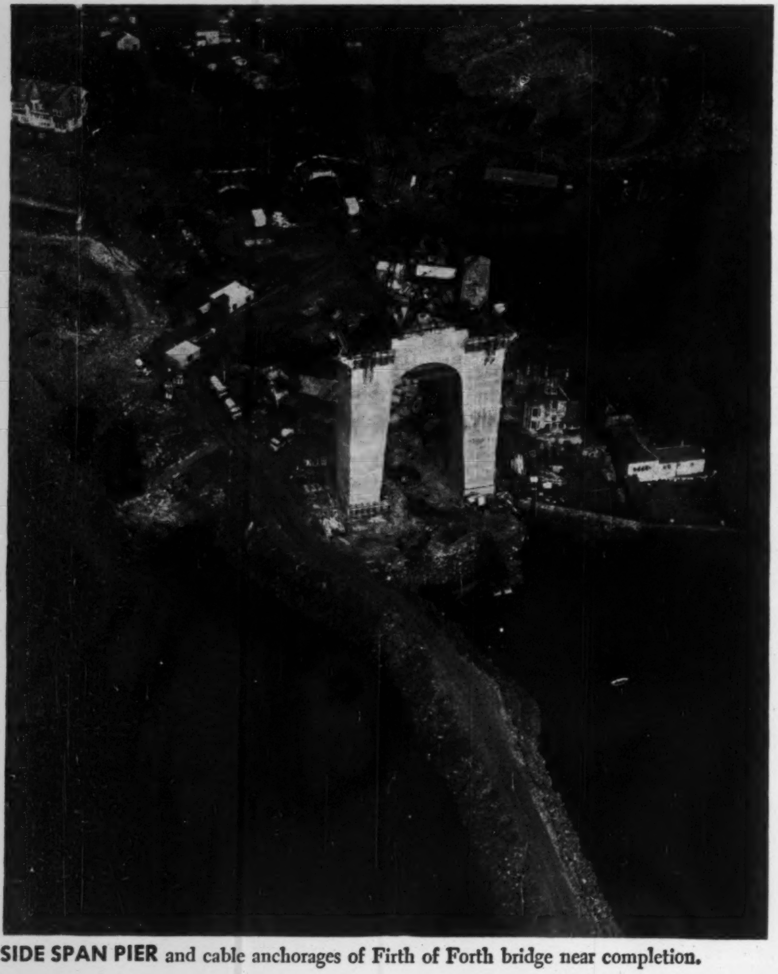
Please send information on the following products:

☐ Truscon Aluminum Classroom Windows
☐ Republic Steel Lockers
☐ Republic ELECTRUNITE® Tubing

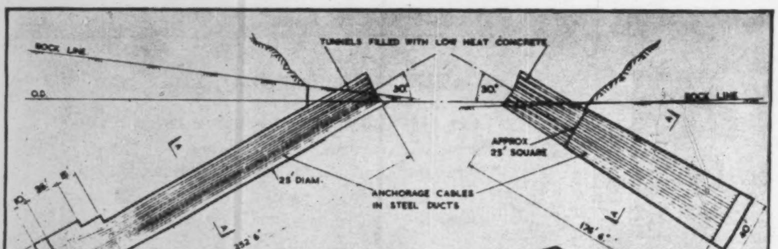
Name__________ Title__________
Firm__________
Address__________
City__________ Zone____ State__________

CIRCLE 145 ON READER SERVICE CARD

Record Suspension Bridge Rises



SIDE SPAN PIER and cable anchorages of Firth of Forth bridge near completion.



TUNNELS IN ROCK were bored by contractor to form anchorages for cables.

First stage work on Great Britain's Firth of Forth highway bridge is nearly complete, and ahead of schedule. The 3,300-ft suspended span will be Europe's longest.

Foundations for the main suspension piers are finished and rest on solid rock. On the south side, the contractor reached sandstone 95 feet below mean water level by sinking caissons in free air. He took advantage of a 40-ft layer of dense boulder clay lying directly above the rock by driving a cofferdam into the clay. The cofferdam then was dewatered.

The cofferdam was made in the shape of a figure eight with circular walings to provide two large unobstructed areas in which to build the caissons (ENR June 25, 1959, p. 28). Two upper walings were fabricated of steel and floated into position. The contractor excavated the river bed to a depth of 13 ft and placed concrete for the lower walings under water.

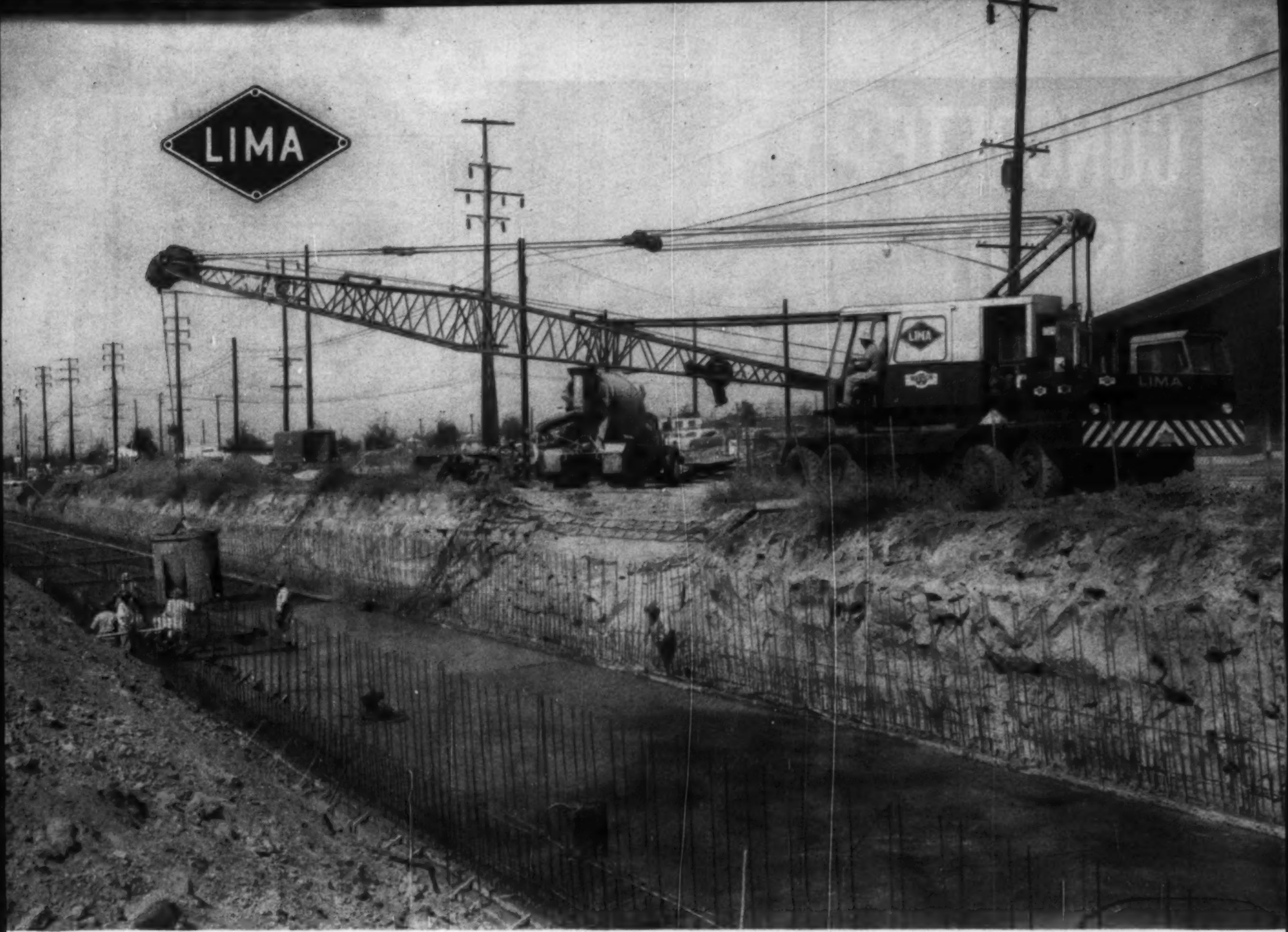
Inside the cofferdam, the contractor built two 60-ft dia reinforced concrete caissons at el −36 and sank them 59 ft by excavating gravel and boulder clay.

The north pier is founded on a submerged basalt reef. The cofferdam was made of sheet piling sealed to the rock by a concrete wall 10 ft thick and 9 ft high placed under water. Workmen anchored the tremie concrete wall to the rock with 44 cables grouted into the rock and prestressed to 50 tons each. After the cables were stressed, the cofferdam was dewatered and remaining concrete placed in the dry.

Each of the twin side spans that flank the main suspended span is 1,340 ft long, extending from the main pier to a pier on shore. To anchor the suspended span on each side of the river, the shore pier carries saddles that deflect the main suspension cables from a nearly horizontal direction to an angle of 20 deg with the horizontal. Main cables pass over the saddles and are anchored in concrete-filled tunnels. The shore piers are, in effect, abutments for the approach structures.

The north shore pier is finished, and the south shore pier is about 75% complete. They are cellular structures of reinforced concrete; the design calls for them to be prestressed to the underlying rock.

The contractor drove tunnels on both sides of the river for the cable anchorages. Each anchorage comprises twin



Lima 64-T daily pours 320 yds. of concrete to speed construction of this Los Angeles County flood control channel.

Has two Limas...buys a third!

"Six years' experience with two 34-T Limas made us decide to buy another Lima when we were in the market for a third truck crane," says master mechanic Rex Williams, of R. A. Wattson Co., N. Hollywood, Calif.

Low maintenance

"We favor Limas for several reasons —easy operating, precision air controls; rapid transportability; low maintenance requirements, and simplified design. I'd say that Limas are top-quality machines, engineered and built for dependable high output!"

The main frame and carrier components of the 64-T are of high-strength, low-weight "T-1" steel. This powerful rig needs no auxiliary aid to lift a 150-ft boom, plus 30-ft. jib, from the ground up. It travels anywhere a truck can go—speeds up to 25 mph.

Pays to buy Lima

There's a Lima type and size for every lifting or digging job! Truck cranes to 80 tons, 140 tons on crawlers; shovels to 8 yds.; draglines variable.

Learn why cost-conscious crane owners and operators agree, "It pays to buy a Lima!"

Ask us for all the facts and figures.

See your nearby Lima distributor. Or write Construction Equipment Division, Baldwin-Lima-Hamilton Corporation, Lima, Ohio.

DISTRIBUTORS IN PRINCIPAL CITIES OF THE WORLD

LIMA Construction Equipment Division, Lima, Ohio

BALDWIN · LIMA · HAMILTON

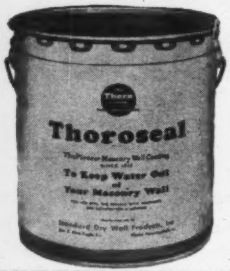
6018

BALDWIN BLH LIMA-HAMILTON

Shovels • Cranes • Draglines • Pullshovels • Roadpackers • Crushing, Screening and Washing Equipment

CONCRETE
IS NOT
FOREVER
Thoroseal

It pays an engineer to remind himself that concrete can eventually break down . . . in major or minor degree depending on weather, corrosion or moisture pressure. When conditions are severe, no reminder is necessary, but somewhat more obscure is the need for high quality protective materials. Inferior coatings always cost more eventually. Since 1912, Standard Dry Wall, Inc. has been in no other business than the protection of masonry, and its products are leaders in the field. Thoroseal, for example, may be easily applied with our money-saving, long-handled brush, and will impart both a waterproof and decorative surface in gray, white or color. Write for our free specification folder on all Thoro System products.


Thoro
Thoroseal
To Keep Water Out of Your Masonry Wall
Standard Dry Wall Products, Inc

Please send new 20-page specification guide describing all products and uses.

Name______________________________

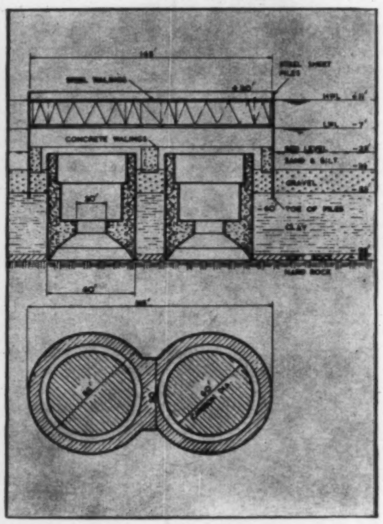
Company____________________________

Address____________________________

Standard | Dry Wall
Box X-2 New Eagle, Pa. | **Products, Inc.**

Plants at New Eagle, Pennsylvania and Centerville, Indiana

CIRCLE 148 ON READER SERVICE CARD



SOUTH MAIN PIER cofferdams, caissons.

tunnels on 80-ft centers driven at an angle of 30 deg with the horizontal into solid rock. Shape and cross section dimensions differ on the two sides of the river (see drawing).

Tunnels for the south anchorage are circular in section and pass through shale with bands of sandstone. Because the shale weathers rapidly on exposure to air, designers called for a continuous steel plate lining for the upper half of the section.

Each tunnel is filled with low-heat concrete and has 114 steel ducts, each of which is 4 in. in inside diameter. Into each duct will be inserted an anchorage cable with a breaking strength of more than 400 tons.

At the mouth of the tunnels, six anchorage cables retain a rectangular steel plate to which are attached four high strength bolts that carry the strand shoes of the main suspension cables. After the anchorage cables have been inserted in each duct and before filling the ducts with cement grout, engineers plan to pre-tension each cable to a load greater than the maximum working load.

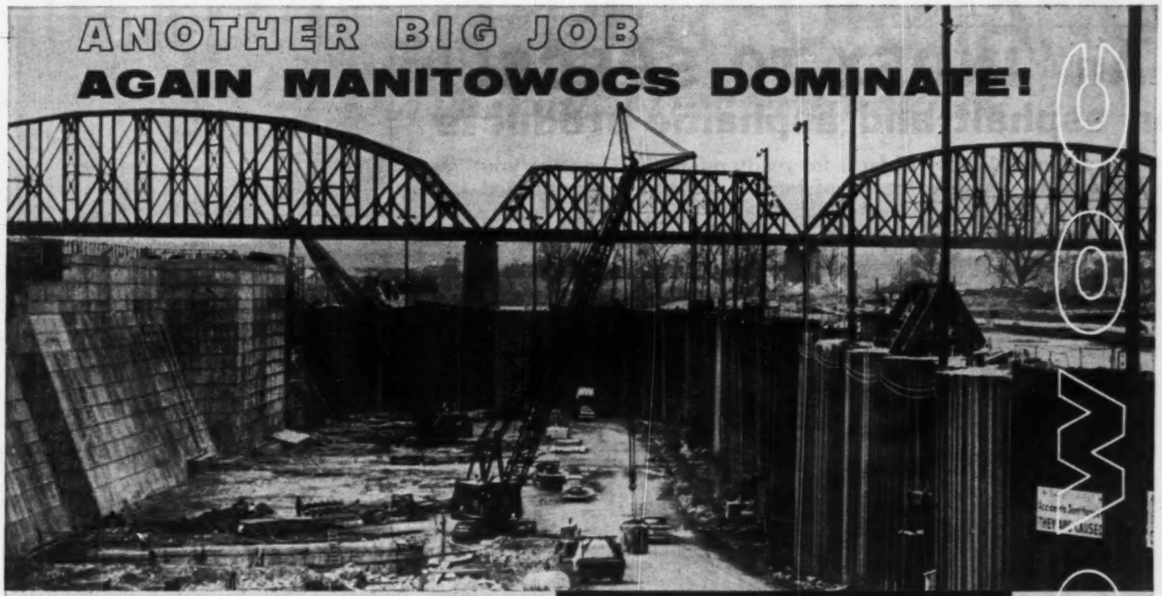
On the north side, tunnels are bored in intruded basalt and are rectangular in section. Roof support has been obtained by bolting.

The main towers are fabricated box sections built up from steel plates. They will be 505 ft high and are being fabricated in the Glasgow plant of Sir William Arrol and Co., Ltd. Tower sections are shopwelded into units up to 47 ft, 6 in. long and weighing as much as 34 tons. Section ends are machined and bolt holes drilled to insure a good fit. Field assembly will be with high strength bolts.

(Continued on p. 150)

ANOTHER BIG JOB
AGAIN MANITOWOCS DOMINATE!

MANITOWOC



Two of the Hardaway Contracting Co. Model 3900 cranes at the Kentucky lock and dam site.

Manitowoc 4500 Vicon dragline dredges 375 yds. of mud and rock per hour.

In Louisville, Ky. work has been progressing for over two years on reconstruction of Lock No. 41, just one phase of a billion dollar, long range Ohio River navigation and improvement program. Initial efforts on the complicated, $19,300,000 Louisville job include the construction of four huge cofferdams.

General contractor is the Hardaway Contracting Co., Columbus, Ga. under supervision of the Louisville District, U. S. Corps. of Engineers. The Hardaway Company has been using two Manitowoc Model 3900 cranes exclusively for the cofferdam construction, handling 13 ton templates and the 60 ft. steel sheet piling to form the coffer cells. The cranes also have been placing concrete for both guard and lock walls. An estimated 375,000 yds. of concrete will have been placed before the job is completed.

On another phase of the Louisville project, Traylor Bros., Inc., Evansville, Ind. has been using a Manitowoc Model 4500 Vicon dragline, equipped with a 147 ft. boom and a 5 yd. bucket, for widening and deepening a mile and a half of the upstream approach channel. The drag moves approximately 375 yds. of mud and rock per hour, widening the channel from 200 to 500 ft. An estimated 3,500,000 yds. of earth and 200,000 yds. of rock will have been removed when the job is finished in late winter of 1961.

Commenting on the performance of the Vicon dragline, Mr. Ford Dyer, Project Manager for Traylor Bros., Inc., said, "We find that the Manitowoc maneuvers better than any other machine of comparable size and that it works 10 to 12 per cent faster." In addition to the dragline, Traylor Brothers have used two Model 3900 Manitowoc cranes at the job site.

On multi-million dollar jobs like this or everyday "bread and butter" jobs, Manitowocs are consistently the choice of contractors needing big output at the lowest possible cost. Be sure to call *your* Manitowoc distributor when you are ready to improve your equipment fleet.

9-C

MANITOWOC ENGINEERING CORP.

(A subsidiary of The Manitowoc Company, Inc.)
Manitowoc, Wisconsin

SHOVELS	CRANES	DRAGLINES	TRENCH HOES
1¼ to 6 YDS.	25 to 125 TONS	1¼ to 7 YDS.	1¼ to 3 YDS.

CIRCLE 149 ON READER SERVICE CARD

Now . . . NEW!

An "INDEX TO SPECS!"
on asphalt and asphaltic products

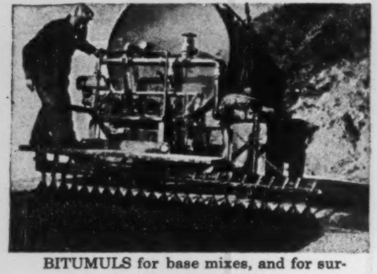
A condensed library of facts for ready reference whenever you need information on the use of asphalt, Bitumuls® (emulsified asphalt), or Laykold® specialty products.

Use the handy coupon, below, to order your copies of these index cards. No obligation, of course.

An index to available literature and data on BITUMULS and other products
A.I.A. FILE NO. 11-D
An index to available literature and data on LAYKOLD specialty products
A.I.A. FILE NO. 11-D
American Bitumuls & Asphalt Company

These index cards have been especially prepared for *your* files. They provide brief data and source-reference information on asphalts and emulsions.

ASPHALT for all types of paving and surfacing



BITUMULS for base mixes, and for surfacing and sealing of pavements—

LAYKOLD specialty products; tennis courts, playgrounds, mastic floors, etc.

American Bitumuls & Asphalt Company

320 Market St., San Francisco 20, Calif.

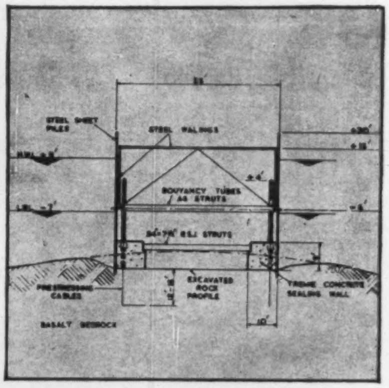
Perth Amboy, N. J.
Baltimore 3, Md.
Cincinnati 38, Ohio
St. Louis 17, Mo.
Oakland 1, Calif.
Atlanta 8, Ga.
Tucson, Ariz.
Inglewood, Calif.
Mobile, Ala.
Portland 8, Ore.
San Juan 23, P. R.

American Bitumuls & Asphalt Co.
P. O. Box 3495, San Francisco, Calif.

Gentlemen: Please send me your new "Index to Specs." file card on:

☐ BITUMULS AND ASPHALTS
☐ LAYKOLD SPECIALTIES

Name..
Firm.............................. Title................
Address...
City & State..


STEEL SHEET PILES
STEEL WALINGS
+30'
+15'
+4'
BOUYANCY TUBES AS STRUTS
-6'
R.S.J. STRUTS
PRESTRESSING CABLES
EXCAVATED ROCK PROFILE
TREMIE CONCRETE SEALING WALL
BASALT BEDROCK
10'

NORTH MAIN PIER cofferdam.

The bridge will carry twin 24-ft roadways, two 9-ft cycle paths and two sidewalks. Clearance will be 150 ft above high water.

Consulting engineers Mott, Hay and Anderson, in association with Freeman, Fox and Partners, designed the bridge; Sir Giles Gilbert Scott is the architect. Joint venture general contractors are Sir William Arrol and Co., Ltd.; Cleveland Bridge and Engineering Co., Ltd.; and Dorman Long (Bridge and Engineering) Ltd. John Howard and Co., Ltd. is the contractor on the foundations and anchorages for the main suspension span.

Turkish Harbor Project Approaches Completion

Construction is nearly complete on the $15-million Mersin Harbor project on the south coast of Turkey.

Two big breakwaters were the toughest parts of the job. One of them, subject to heavy waves, is a 5,000-ft-long rubble mound in assorted layers, with stones weighing up to 14 tons each. The other breakwater is a 7,800-ft-long vertical wall of 60-to-65-ton concrete blocks. Nearly 10,000 blocks were used.

Quay walls, jetties and piers, shore protection and connecting roads and railways for the 800-acre Mediterranean port are being built by the Royal Netherlands Harbour Works Co., Amsterdam, Holland.

About 11 million cu yd of dredging will be completed by the end of the year. Most of the harbor will be 21 to 33 ft deep, but a special 42-ft-deep channel will be dredged for oil tankers of up to 60,000 dw tons. Oil will be piped to a refinery under construction four miles away.

In the center of the harbor the British firm of Simon Handling and the Danish firm of Christiani and Nielsen have constructed a 110,000-ton grain silo. The Dutch company is now building a 960-ft prestressed concrete jetty for grain transport from silo to ships.

MATCHED PERFORMANCE

To Save You Time and Work

The NAYLOR Wedgelock coupling makes a positive connection, securely anchored in standard weight grooved ends.

Take NAYLOR Spiralweld pipe . . . make connections with NAYLOR Wedgelock couplings . . . and you have a pipe line combination to save time, work and money.

Here's why! NAYLOR pipe is light in weight, so it's easier to handle and install. The distinctive NAYLOR lockseamed-spiralwelded structure makes it extra strong and safe in service.

You're ahead, too, when you use the Wedgelock coupling because it is designed for faster, easier, more economical make-up. A hammer is the only tool needed to connect or disconnect it.

For air, water and ventilating service, you can't beat the matched performance of this NAYLOR pipe and coupling combination. Write for Bulletin No. 59.

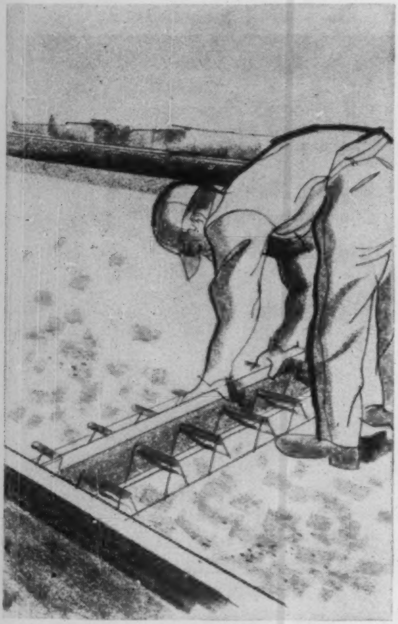
NAYLOR PIPE *Company*

1248 East 92nd Street, Chicago 19, Illinois

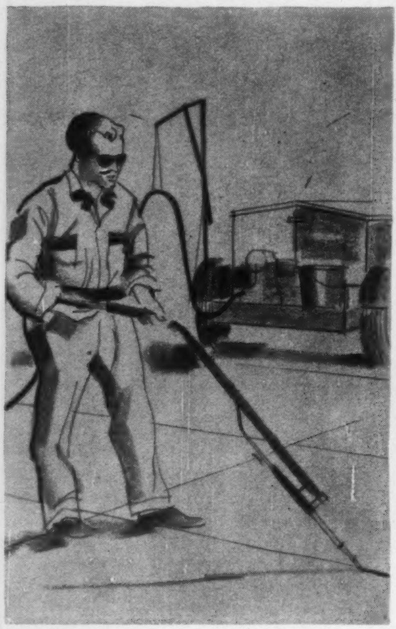
Eastern U. S. and Foreign Sales Office: 60 East 42nd Street, New York 17, N. Y.

QUALITY SEALTIGHT® PRODUCTS FOR

JOINT SEALING COMPOUNDS



EXPANSION JOINTS



VAPOR SEALS

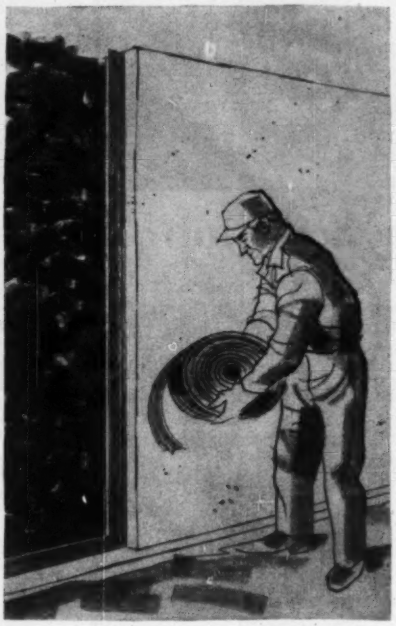
ONE DEPENDABLE SOURCE FOR A COMPLETE LINE

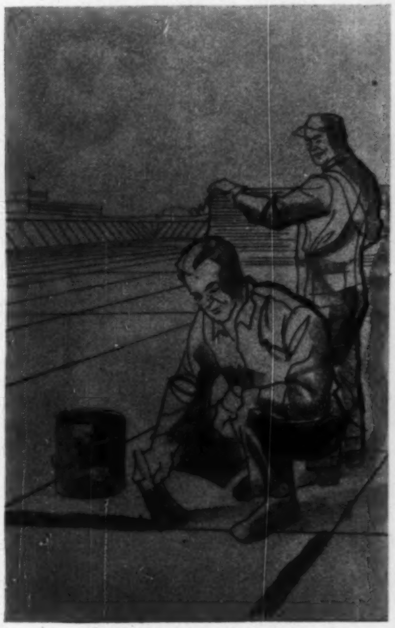
- "PREMOULDED MEMBRANE" Vapor Seal assures complete isolation of the structure from the site . . . waterproofs — vaporproofs. Ideal for all types of construction. Water Vapor transmission rating of only .0066 gr. per hr. per sq. ft. Strong . . . permanent . . . may be installed as a complete monolith. Write for Catalog No. 1660.
- "CORKTITE" Impermeable Perimeter Insulation will effectively prevent heat loss for the life of the structure. Not affected by moisture, K value is constant. Used wherever good design requires a proper insulation below-grade to permanently retard heat loss. Write for Catalog No. 1660.
- EXPANSION JOINTS in a type and size to meet your exact specifications. Sealtight line includes: Asphalt, Fibre, Gray Sponge Rubber, Corkfill, Plain Cork and Self-expanding Cork Control (Expansion) Joints. Ideal for highways, pavements, runways, bridges, buildings, ramps, etc. Write for Catalog No. 100.
- JOINT SEALING COMPOUNDS that provide a positive joint sealer for years of economical, trouble-free joints in concrete construction. Available in four types: Hot and Cold Pour Rubber-Asphalt Joint Seal, and Hot and Cold Pour Jet Fuel Resisting Rubber-Asphalt Joint Seal. Write for Catalog No. 100.
- DUO-PVC WATERSTOPS that are extruded simultaneously from two top-quality PVC compounds. Designed with an exclusive new U-bulb center section that permits this waterstop to safely accommodate elongation *correctly* . . . without stretching the material or stressing the multiple-rib area. Write for Catalog No. 100.
- "HYDROMAT" ASPHALT LINERS that are ideal for lining all domestic, industrial, municipal and recreational facilities where the containment of water, wastes, sludges, brines, etc., demand an efficient, economical and impervious lining material. Write for "HYDROMAT" Manual.
- BUTYL CAULK, a top-quality, elastameric, single component joint sealing or caulking material that is applied directly from container. Available in trowel or gun grade. Will adhere to any reasonably clean surface. Write for Catalog No. 100.
- WRITE FOR CATALOG No. 100 for additional information on any of the following products: • Premoulded Tongue and Groove Joints • Plane of Weakness Dummy Joints • Concrete Curing Compounds of all types • Sewer Joint Compounds • CM-60 Polysulfide Base Joint Sealing Compound • • Air Entraining Agents • PVC Base Plates • Asphalt Plank • • Bridge Pads • Mastic Lath • Corrugated Closure Strips • Plus many, many others.

National distribution assures prompt service and delivery

CONCRETE CONSTRUCTION . . .

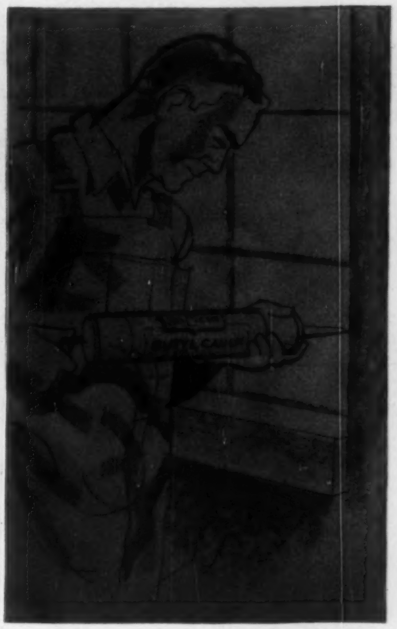
WATERSTOPS





ASPHALT LINERS

CAULKING COMPOUNDS



OF PRODUCTS USED IN CONCRETE CONSTRUCTION

FOR COMPLETE INFORMATION . . .

SEALTIGHT
ELIMINATE MOISTURE PROBLEMS

The SEALTIGHT line includes a *complete* line of modern, job-tested products used in the construction of highways, bridges, airports, dams, ramps, etc., plus an allied line of specialty products used in the construction of industrial, institutional, commercial and residential buildings. SEALTIGHT products are developed specifically to meet the need of modern engineering practices and manufactured to strict quality control standards to meet the rugged demands of the construction industry. Specify and use SEALTIGHT products secure in the knowledge that these products not only meet but exceed specifications and will effectively perform their designated function. SEALTIGHT products are available nationally through a vast network of Sales-Engineers, Manufacturer Representatives, Distributors and Dealers . . . each is ready and willing to serve you.

- CATALOG No. 100 . . . graphically describes and illustrates the Sealtight line of products used in the construction of Highways, Pavements, Bridges, Airports and Concrete Structures of all types.
- CATALOG No. 1660 . . . discusses need for a true vapor seal and provides proof-positive as to how "Premoulded Membrane" fulfills this need. Illustrates and describes the product, its applications and installation facts.
- HYDROMAT MANUAL . . . a technical manual describing the many applications for Hydromat Asphalt Linings. Covers cost-saving advantages of this product, discusses the many and varied applications and contains installation data.

SEALTIGHT®

PRODUCTS
FOR BETTER
CONSTRUCTION

W. R. MEADOWS, INC.

16 KIMBALL STREET
ELGIN, ILLINOIS

Please send, without obligation, the following information:

☐ CATALOG No. 100 ☐ CATALOG No. 1660
☐ HYDROMAT MANUAL

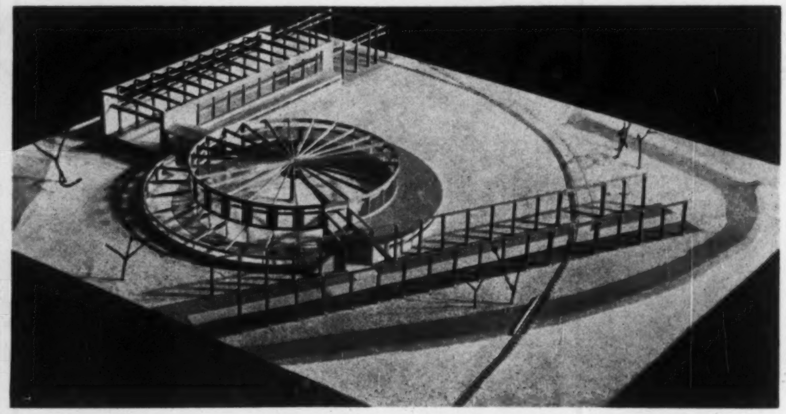
NAME ____________ TITLE ____________

FIRM ____________

ADDRESS ____________

CITY ____________ STATE ____________

CIRCLE 153 ON READER SERVICE CARD



Fabricator Tests Circular Shop

An Austrian steel fabricator is building a circular shop to increase production efficiency. Engineer Heinz Sernetz, who heads the Stahlbauwerk L. Bindu & Co. of Graz, figures that his 262-ft-dia circular layout will reduce transport distances within the shop by 22%. Basis for this comparison is a long rectangular layout (62 ft wide x 656 ft long) equal in area to the circular layout.

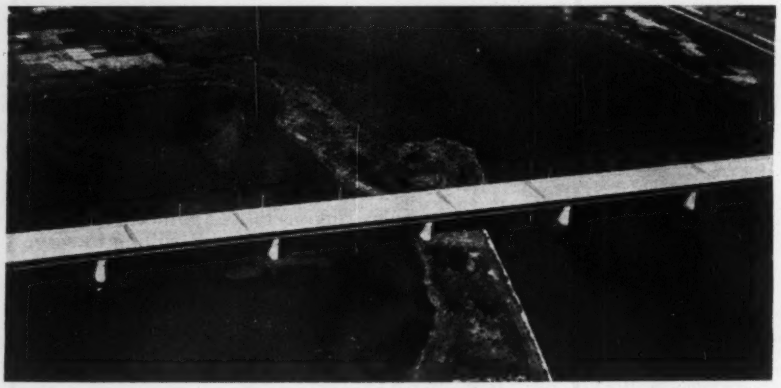
The fabricator shortened the transport distances by arranging the work area into two concentric production circles, one along the perimeter wall and the other around a central column.

The central shop column is a hollow steel pipe column of 6 ft 7 in. dia. Radial roof purlins of the inward sloping roof frame to the top of this giant column. A stiffened circular flange supports the interior crane rail. Supported by circular beams at the perimeter, the radial crane revolves around the center column.

The hard-worked center column is also used as a rainwater conductor, mounting for loudspeaker and TV eye production control system and as a central hub for utilities.

Ring-shaped supply lines for three-phase (380V) current, compressed air and water are placed above each of the two production circles. This layout prevents cluttering floor space.

Completion of the circular shop is scheduled for spring 1961. Rectangular-shaped buildings flanking the shop will serve to assemble and dispatch fabricated steel. Total project cost: $1 million.



Japanese Complete Tollroad

Japan Road Construction Corp (Doro Kodan) has completed a 5-mile-long bypass between Tokyo and Funahashi at a cost of $5 million.

The tollroad, called the Keiyo Highway, is about two miles shorter than the old route, and cuts travel time to one-third that previously necessary. The four-lane highway is 53 ft wide and incorporates two bridges over the Edogawa River. Total length of the two bridges is 2,244 ft.

Doro Kodan expects to recover its construction costs in about 20 years, after which the by-pass will become a free road.

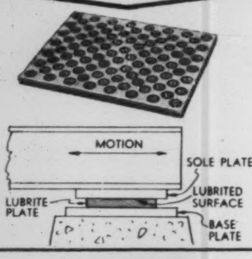
FOR SELF LUBRICATING SECURITY AT ITS FINEST . . .

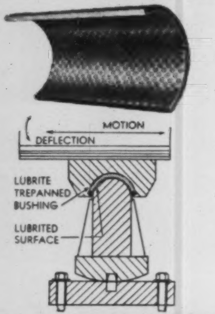
Specify

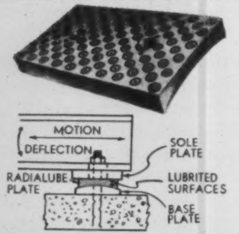
Lubrite®

EXPANSION PLATES & BUSHINGS

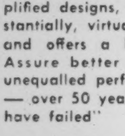
3 BASIC LUBRITE ASSEMBLIES FROM MANY AVAILABLE







When expansion, contraction and/or rotation of structural members are factors in the design of any bridge, overpass, building or other construction, Lubrite offers many distinct and important advantages. Specifically Lubrite permits the use of simplified designs, cuts construction costs substantially, virtually eliminates maintenance and offers a low coefficient of friction. Assure better results, longer life and unequalled performance — specify Lubrite — over 50 years of success "where others have failed"



Send for this free 20 page Lubrite Manual No. 55 — contains complete information, technical data and specifications about Lubrite Self Lubricating Plates and Bushings.

LUBRITE DIVISION
MERRIMAN BROS., INC.
191 Amory Street Boston 30, Mass.

Marion Outdigs Hoe Twice its Size

Eight-ton boulders, deep frost and hardpan were only a few of the many problems faced by this contractor when he put his Marion 35-M hoe to work excavating the sewer and pipe lines for a $6 million high school project in Passaic, New Jersey.

Digging 300 ft. each 8-hour shift, this Marion utilized its basic stability and long reach to good advantage in getting the job done on schedule. Because of the narrow working space between the 13 buildings in this high school group the 3/4 yd. profit maker was frequently able to out-produce a less manueverable 1-1/2 yd. machine on the same job.

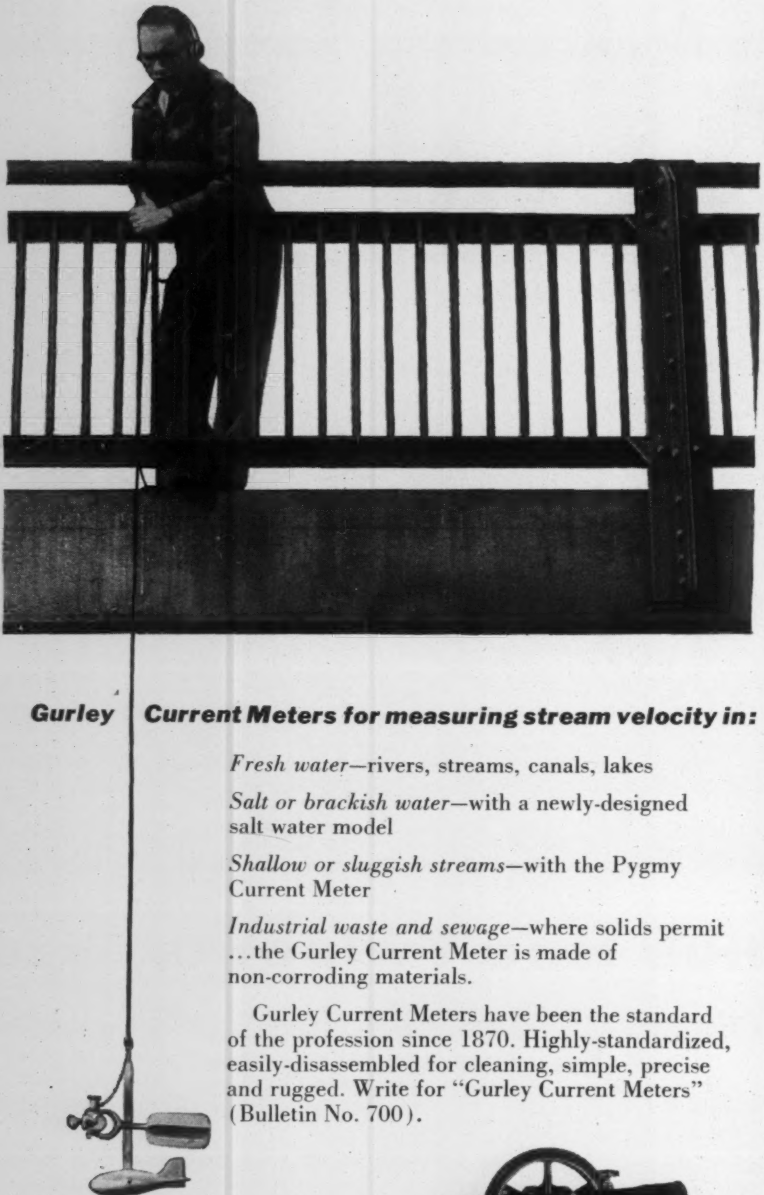
The Marion 35-M is a machine that doesn't have to be "babied", even in the roughest digging. It's ruggedly built to withstand high shocks and handles peak loads that make other units groan. There's a Marion machine of the right size and capacity to handle your particular problem. Your nearest Marion distributor is the man to see.

You get **MORE** *with* **MARION**

Marion Power Shovel Company, Marion, Ohio

A Division of Universal Marion Corporation

CIRCLE 155 ON READER SERVICE CARD



Gurley Current Meters for measuring stream velocity in:

Fresh water—rivers, streams, canals, lakes

Salt or brackish water—with a newly-designed salt water model

Shallow or sluggish streams—with the Pygmy Current Meter

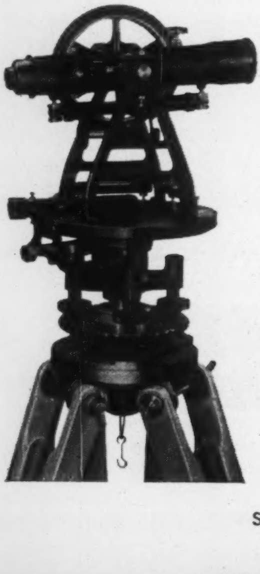
Industrial waste and sewage—where solids permit ...the Gurley Current Meter is made of non-corroding materials.

Gurley Current Meters have been the standard of the profession since 1870. Highly-standardized, easily-disassembled for cleaning, simple, precise and rugged. Write for "Gurley Current Meters" (Bulletin No. 700).

Have you tried the Gurley optical plummet transits?

Two Gurley transits now feature built-in Optical Plummets to eliminate plumb bobs. The Optical Plummets will focus on distant objects—or as close as 12 inches. Built-in shifting head allows 2-inch shift over a point, giving ample leeway in initial set-up. Write for Bulletin OP-100.

W. & L. E. GURLEY
Union Plaza, Troy, N. Y.



$83-Million Dam to Go On Morocco's Moulouya River

Construction has begun on the $83-million Mechra Klila Dam project in northeastern Morocco on the Moulouya River. The 200-ft-high concrete gravity dam will be part of an irrigation project that will include a storage reservoir, four irrigation canals, a six-mile tunnel, distribution systems, drainage works, and land-improvement work for 31,000 acres. One power penstock will be installed.

The length of Mechra Klila at the crest is about 860 ft, width at the top about 14¾ ft, and at the base about 147½ ft. The volume of concrete is 273,000 cu yd. Spillway capacity of the dam is 210,600 cu ft per sec. Maximum flood in recent years was 122,850 cfs in May 1949. Reservoir length is about 12 miles and its capacity 510,000 acre-ft.

Mechra Klila is on the fault line of the recent Agadir-Orleansville earthquake, but seismologists say it is not in an active earthquake zone. Final reports of seismologists, however, may call for certain modifications in the dam. On-the-site checks were made by representatives of the Institute de Physique du Globe and of Hydrotechnic Corp. of New York.

The Development Loan Fund has granted a $23-million loan to Morocco for the project. The Mechra Klila construction contract has been awarded to a Spanish-American company, Aepo Raymond, Agrupacion Estudio y Projecto Obra, in association with Brown Raymond Walsh.

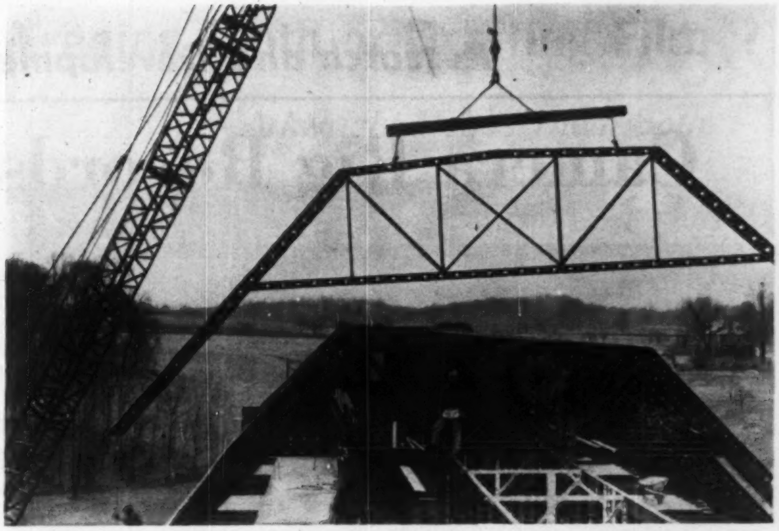
Cultural Center Slated For Downtown Montreal

Ground will be broken this Fall for the first stage of a $14.5-million cultural center in Montreal, Canada. The first structure scheduled for construction is an $8.5-million concert-opera hall (in the center of the project).

"Place des Arts" eventually also will get a large theater for stage presentations, a smaller theater for chamber music, and a group of commercial structures. Funds still need to be raised for these buildings, but almost all the needed real estate has been acquired.

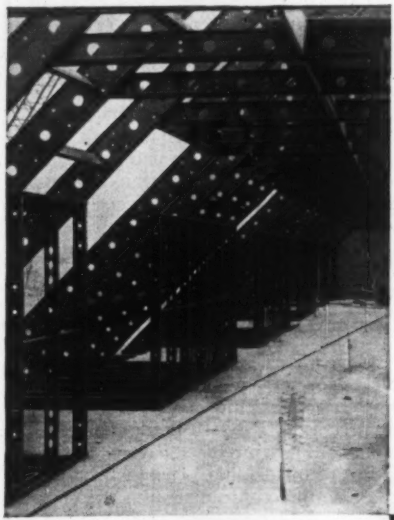
The concert-opera hall will seat 3,100 persons. The proscenium arch will be 69 ft high.

Architects are Affleck, Desbarats, Dimakopoulos, Lebensold, Michaude & Sise of Montreal. Structural engineers are Brouillet & Carmel of Montreal. General coordinator is the Raymond Loewy Corp., New York City.



After fabrication, roof trusses were raised into position by a mobile crane and securely welded in place in a matter of minutes. Smaller panels were light enough to be carried and erected without handling equipment.

Architect tells why he selected Penmetal structural framing for Methodist Country House



According to the architectural firm of Dollar, Bonner, Blake and Manning, "The reasons for our choice were numerous, but the most important were that the light steel would provide a lightweight incombustible frame and that the nailable feature of the members would provide a simple means of attaching other materials.

"We were also convinced that light-steel framing was no more expensive than other types of construction, and that proper panelization would result in a rapid rate of progress in erection. The latter two points were subsequently proven to be correct by the results achieved in this project."

The structure of Methodist Country House combines a minimum of heavy steel with extensive use of Penmetal framing. Interior walls are plaster over Penmetal rib lath, which was nailed to double studs. Roof trusses were fabricated from 10", 15-gage and 6", 16-gage joists.

Write for details of this versatile framing system. Ask for a copy of catalog SS-33.

PENN METAL COMPANY, INC.

***Structural Framing Sales Office:* P.O. Box 1460, Parkersburg, W. Va.**

Executive Offices: 40 Central St., Boston 9, Mass.

Plant: Parkersburg, W. Va.

District Sales Offices: Boston, New York, Philadelphia, Pittsburgh, Chicago, Detroit, Dallas, Little Rock, Seattle, San Francisco, Los Angeles, Parkersburg, St. Louis

METHODIST COUNTRY HOUSE
Wilmington, Delaware

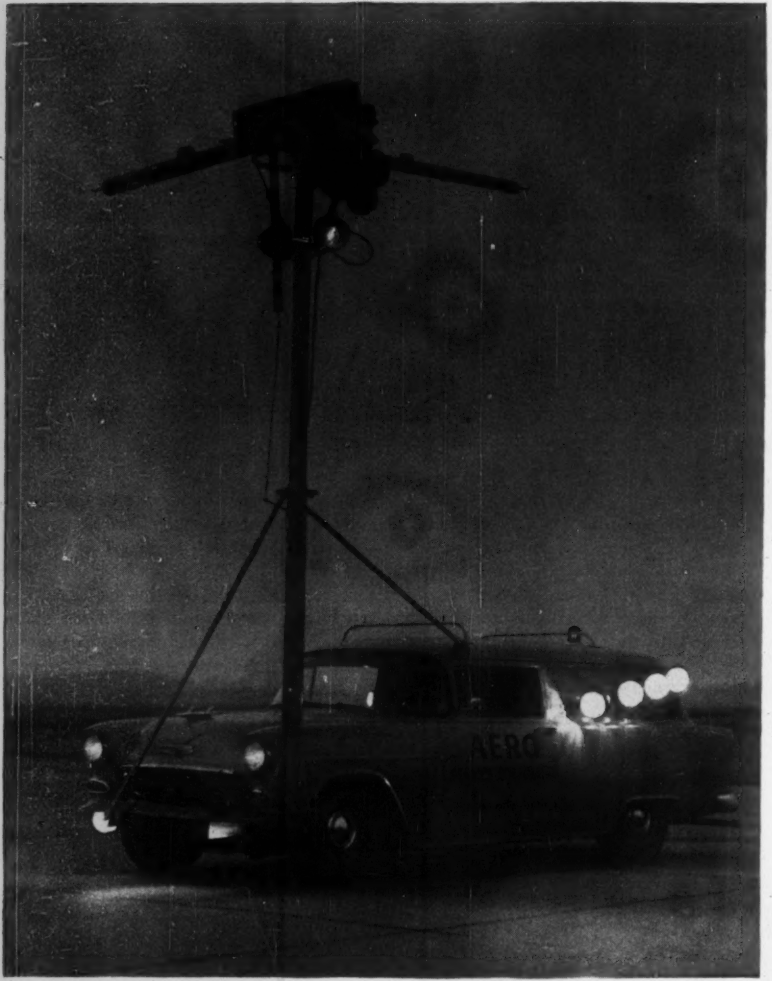
ARCHITECTS:
Dollar, Bonner, Blake and Manning
STRUCTURAL ENGINEER:
L. H. Doane Associates, Inc.
GENERAL CONTRACTOR:
Haddock Construction Co.
STEEL ERECTION:
Delaware Steel Service, Inc.

METAL MARK Penmetal 1869 OF QUALITY

a name to remember

PM-251

Camera Rig Records Pavement



Special truck carries strip camera for night surveys.

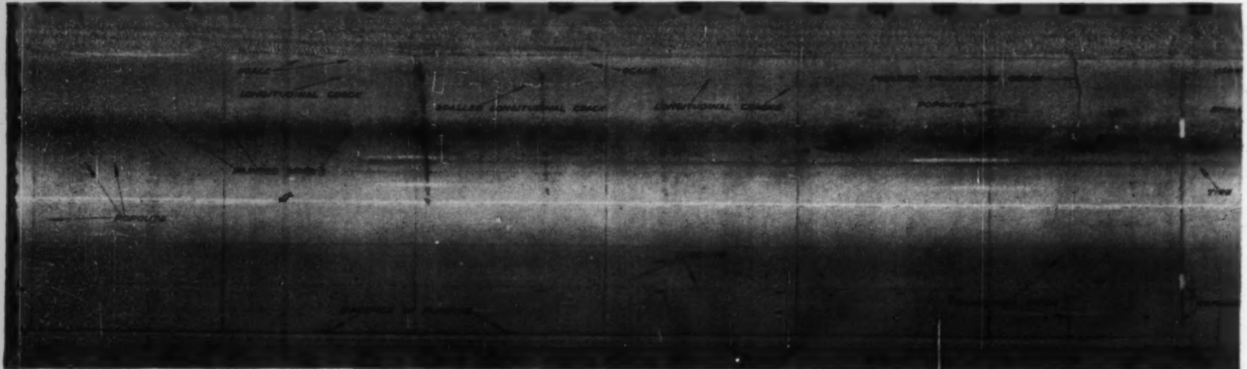
An efficient, low-cost system of photo-recording is now being used for highway pavement condition surveys; it can be applied to airports, railroads, subways, bridges, tunnels and other structures, and it can be used for inventory, maintenance, research and public relations purposes.

The system known as "Sur-Fax," includes a precise strip camera, specially equipped truck, film projector and reader-printer.

The truck carries a heavy, shock-absorbing stabilized mast, which supports the continuous strip camera. Vertical position of the camera is adjustable, with maximum height of about 14 ft. The camera records a strip as much as 36 ft wide, on 35-mm film, at a scale of 1 in. equals 36 ft.

The truck also carries a battery of shielded high powered lights, generator and control equipment. Photographs taken under the lights clearly show such pavement faults as scaling, cracking, and raveling. The photographs also have a three dimensional effect that makes possible approximate measurements of the depths of potholes, aggregate pop-outs and other defects. Highway surveys are made at night with the truck moving at a speed of 20 to 30 mph. Identification numbers can be placed on the film at predetermined intervals or at locations selected by the operator.

Continuous film strip positives (contact size) are produced from the 35 mm negatives and may be projected as large as 10 ft by 10 ft for conference study. The producer, Aero Service Corp., Philadelphia, customarily supplies another continuous film strip posi-



Strip photo (scale: 1 in.=5 ft) is one product of new process.

Condition

tive, which is enlarged to a scale of about 1 in. equals 5 ft. Surveys are done on a contract basis.

Using a specially modified, variable-speed projector, the contact size film strip positive may be viewed at a rate equivalent to slow walking speed (2 mph). The adjustable speed driving mechanism on the projector can be stepped up to an equivalent of 30 mph, or it can be stopped and a film section held on the screen for detailed examination.

For additional study, the producer utilizes a 3-M Reader-Printer developed by Minnesota Mining and Manufacturing Corp. and modified by Aero Service engineers. This device projects the 35-mm film strip on an 18x24-in. viewing screen. As pavement sections that require additional study come into view, the operator, by touching a button, stops the film and makes a positive print, which is delivered within 30 seconds. The print may be annotated and used as a work sheet by engineers and maintenance crews.

Record forms are provided for noting conditions observed on the strip film. This information can be transferred to punch cards for statistical analysis and broad studies.

First large-scale use of the equipment was on the AASHO Test Road near Ottawa, Ill. One survey has been completed, another is being conducted, and a final survey will be made this fall following completion of testing.

Specific cost data are not available. Aero Service engineers, however, estimate the method to be from ⅕ to $\frac{1}{10}$ as costly as a condition survey made by walking or riding over the road.

LONGITUDINAL CRACK
TRANSVERSE CRACK
TWO LANE CONCRETE PAVEMENT
10'

Tracing Cloth or Drafting Film*?

Arkwright Makes Them Both

*Based on DuPont "MYLAR" polyester film.

JARVIS DeBRIS
MOORE & DeBRIS
BATON ROUGE, LA.
CONSULTING ENGINEER

In reply to the question as to where Moore and DeBris were going to put the new sewage disposal plant for Honeywater, Miss., Jarvis DeBris proudly replied:

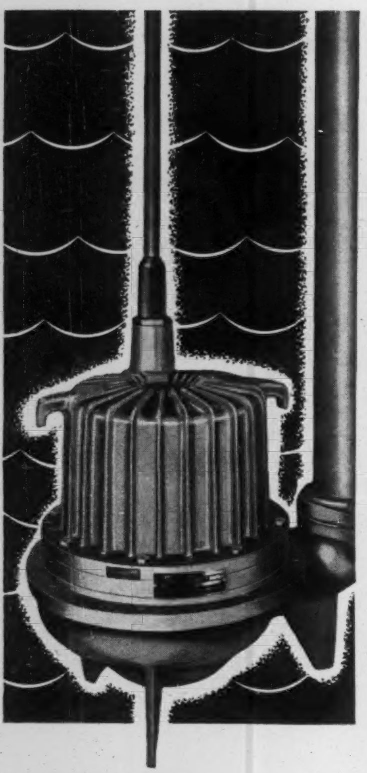
"Where else but on Arkwright. When you use that perfect working surface, everything is clean and clear — no blobbing, no feathering, no ghost. And — Arkwright's new drafting film is ideal for making sharp, clean reproductions at fast printing speeds. You ought to try some — Arkwright."

For perfect performance on cloth, specify the roll with the blue line — Arkwright. See for yourself the advantages of Arkwright's perfect coated surface on drafting film. Film available in several thicknesses. Both cloth and film in cut sheets or rolls. Write today for free samples.

Arkwright Finishing Division, Arkwright-Interlaken Inc., Fiskeville, R. I.

It's precisely right on Arkwright!

ARKWRIGHT
FINISHING DIVISION
Arkwright-Interlaken Inc.



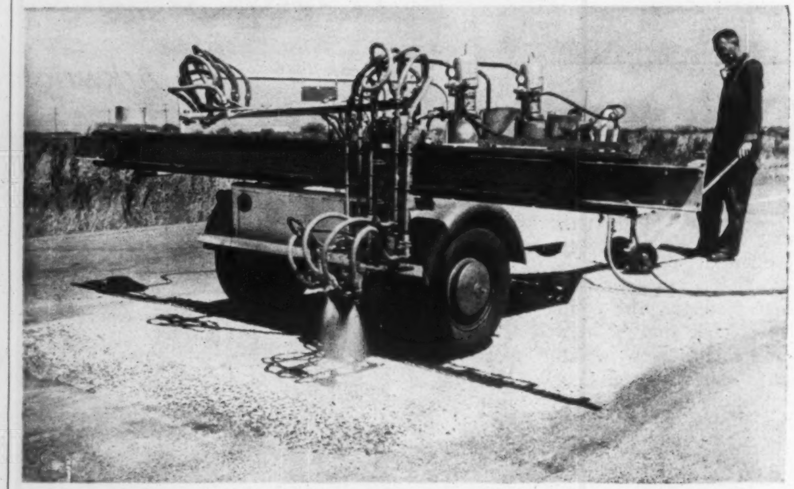
EFFICIENT, SAFE

Weinman immersible non-clog pumps

You can't do better than Weinman Type M pumps for handling sewage, drainage water or industrial waste. They are quickly installed, no pit cover or special installation features required. Just lower pump into pit, connect discharge line and waterproof lead cable — it's ready to go to work. Ideal for portable or permanent installations.

If you have a pumping problem, get in touch with your Weinman pump specialist. He's listed in the Yellow Pages of your telephone directory. Or, write us for Immersible Non-Clog Pump Bulletin No. 1700.

The WEINMAN PUMP Mfg. Co.
290 SPRUCE ST. COLUMBUS 15, OHIO
CENTRIFUGAL SPECIALISTS



Rumble Strip Warns Drivers

The Contra Costa County (Calif) Public Works Department and California Research Corp are testing a rock-and-plastic "rumble strip" that warns motorists to slow down as they approach a danger area.

The location chosen for the first test is a one-mile section of county road that takes an abrupt turn just over the crest of a low hill. An average of seven major accidents per year have occurred at this location when drivers failed to decrease speed in time to make the turn.

The strips incorporate a high-impact Isopolyester resin as binder in the top layer.

Strips are 10 ft wide and 25 ft long. First step in construction over an existing portland cement concrete pavement is application of a tack coat of penetration grade asphalt. Crushed rock is then distributed by a mechanical spreader and compacted with a rubber-tired roller.

Workmen then spray resin on the strip and follow this with a sand application. Strips have been installed at intervals determined by traffic studies.

According to Cal Research, a subsidiary of Standard Oil Co. of California, traffic can move over the strips within a few hours. Further research is expected to reduce this time to one hour or less.

Rumbler strips have been used successfully in other parts of the country. Notable is the experience of Cook County, Ill., where engineers have installed asphalt-and-rock strips on stop sign approaches. Their use has drastically reduced stop sign violations.

Corps Studies Fish Survival

Survival of small fish passing over dams and through high head turbines is less a function of the height of the dam than of the characteristics and speed of the turbine. This is the preliminary finding of a U. S. Army Corps of Engineers' study of 40,000 fingerlings passed over Cushman Dam on the Skokomish River in western Washington.

The objective of the test was to determine if a high level of survival could be attained in passing fish through a turbine having a head of 450 ft and if the survival rate changed with the power loading and tail water levels.

The test was a continuation of laboratory tests previously conducted at the hydraulic laboratory of Allis-Chalmers Manufacturing Co., York, Pa., using both Kaplan and Francis type runners. The effect of turbine speed and draft tube pressure upon fingerlings was the study objective.

The Corps chose the Cushman Dam for field tests in order to develop a criteria for the design of turbines that would successfully pass fish at the proposed Bruces Eddy Dam on the Clearwater River in north central Idaho.

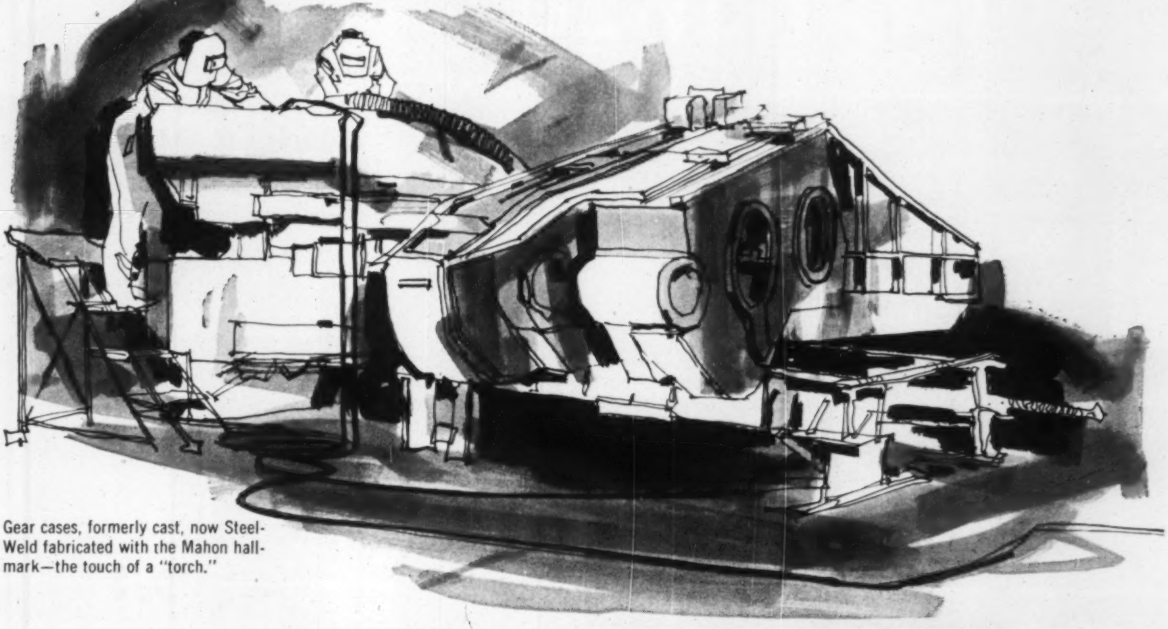
Chinook and silver salmon, averaging 2¼ in. to 3½ in. in length, and 5-in. to 9-in.-long steelhead were used for the tests and controls. The fish were tatooed in various combinations of color and marking for the experiments. The steelhead was furnished by the Washington State Department of Game, and the Washington State Department of Fisheries supplied the salmon.

Tests included passing fingerlings

MEN WHO KNOW
FACILITIES, CAPACITY
AND **EXPERIENCE,** BUY...

"fabrication by Mahon"

Unmatched experience . . . from fabricating hundreds of thousands of parts of all types, both mechanical and structural . . . has sharpened old-time craftsmanship into a modern production art, uniquely applied by Mahon's Steel-Weld Division. No matter what kind of fabrication—welding, machining, or assembling—your parts might require, Mahon's experience is yours at **no extra cost.** This depth of experience is backed by extensive facilities and large capacity to provide the best **single-source-service** for fabrication of a part or a production lot. Besides steel, Mahon also fabricates alloy or aluminum designs.



Gear cases, formerly cast, now Steel-Weld fabricated with the Mahon hallmark—the touch of a "torch."

Non-destructive radiographic inspection insures highest quality work by Mahon—Master of Metals.

WRITE TODAY FOR NEW STEEL-WELD LITERATURE . . . OR, FOR ON-THE-SPOT HELP, DISCUSS YOUR DESIGN REQUIREMENTS WITH A MAHON FABRICATION ENGINEER

THE R. C. MAHON COMPANY • DETROIT 34, MICHIGAN

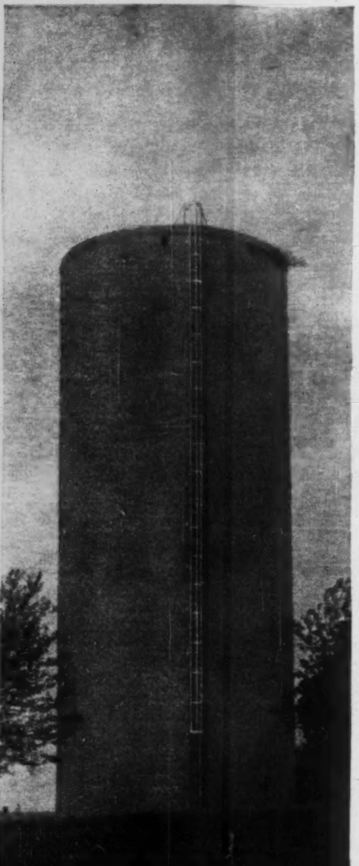
Manufacturing Plants—Detroit, Michigan and Torrance, California

Sales-Engineering Offices: Detroit, Chicago, New York, San Francisco and Torrance

MAHON

CIRCLE 161 ON READER SERVICE CARD

MORE THAN 2000 PRESTRESSED CONCRETE TANKS IN SERVICE



New 660,000 Gallon Stand Pipe. City of Wadsworth, Ohio.

Consider these features

- Minimum maintenance
- 75% construction cost spent locally
- Owners seldom return to other types
- Longest service life of any tank
- Lowest overall cost to community

Send for Bulletin T-22

PRELOAD

THE PRELOAD COMPANY, INC.
355 Lexington Ave., New York 17, N. Y.
Tel.: MUrray Hill 7-0488

351 Jefferson, Dallas, Texas
Tel.: WHitehall 1-5707

PRELOAD CONCRETE STRUCTURES INC.
837 Old Country Road
Westbury, L. I., N. Y.
Tel.: EDgewood 3-4040

THE CANADA GUNITE COMPANY, LTD.
125 Hymus Boulevard
Pte Claire, P. Q., Can.
Tel.: OXford 5-6772

HERRICK IRON WORKS
28400 Clawiter Road, Hayward, Calif.
Tel.: LUcerne 1-4451

through penstock and turbines at various power loads, settings and tail water levels. Recovery of the experimental test fingerlings during the various power loadings and tail water elevations was made possible by using a fine mesh net stretched across the draft tube outlet. Fingerling groups were also used as a control to determine handling losses.

Cushman No. 2 plant has a hydraulic head of 450 ft, a turbine speed of 300 rpm and a turbine runner diameter of 76 in. The fish were introduced into the penstock with a lock device at the 350-ft level and recovery was made from the paved tailrace. The draft tube discharge was about 800 cfs.

About 89% of the total number of fingerlings used during the 48 trials were recovered. Survival rates ranged from a low of 42% for partial power load to a high of 75% for power load giving the best turbine efficiency.

Mechanical injuries accounted for about 50% of the mortality while pressure injuries at gate opening for best turbine efficiency appeared to be comparable to the mortality rate experienced in turbine passage studies made at McNary Dam.

Corps officials said that the next phase of any test program to further explore the feasibility of passing fingerlings through high head turbines should be a turbine model study to determine design and speeds best for passing fish.

BPR Will Set Standard Specs for Motor Graders

The Bureau of Public Roads is preparing a federal interim specification for motor graders at the request of the General Services Administration.

The specification, which it is hoped will take much of the confusion out of current methods used by manufacturers in rating their equipment, is a product of several years of study and field testing at the proving grounds of the Corps of Engineers at Fort Belvoir, Va.

The need for a standard specification has long been apparent. It was pointed up to the BPR investigators when, during their initial studies in the problem, they found that manufacturers of motor graders use at least four methods of rating available horsepower, thereby making any accurate comparison of the machines almost impossible.

These methods range from consideration of gross maximum-duty horsepower without deductions for any power absorbing accessories, such as generator, fan, fuel and water pumps, etc., to a figure based on net intermittent-duty horsepower with deductions for all power absorbing engine accessories.

To establish a preliminary basis for

MINIATURE 2-WAY RADIO SYSTEM Keeps YOU in CONTACT in ANY Situation; ANY TIME, ANYWHERE!

the SEISCOR TELEPATH

. . . is a portable industrial quality communications system that becomes a part of your wearing apparel. It is engineered for short-range applications where dependability and convenience of use are essential. Precision circuit and durable construction provide extremely low maintenance and trouble-free operation!

- **Fully transistorized printed circuit**
- **Crystal-controlled superheterodyne receiver**
- **Crystal-controlled transmitter**
- **Long battery life**
- **For any single frequency between 20-55 mc., A.M.**
- **No license required on 27 mc. units.**

MODEL HR
Hardhat with built-in transceiver, antenna, earphones and mike. High and low noise level models available.

MODEL BR
Belt-clip transceiver and headset with built-in antenna, earphones and mike. High and low noise level models available.

Let Seiscor Engineers analyze your short-range communications problems. Example: Special units have been designed into protective clothing for crash-crew fire fighters.

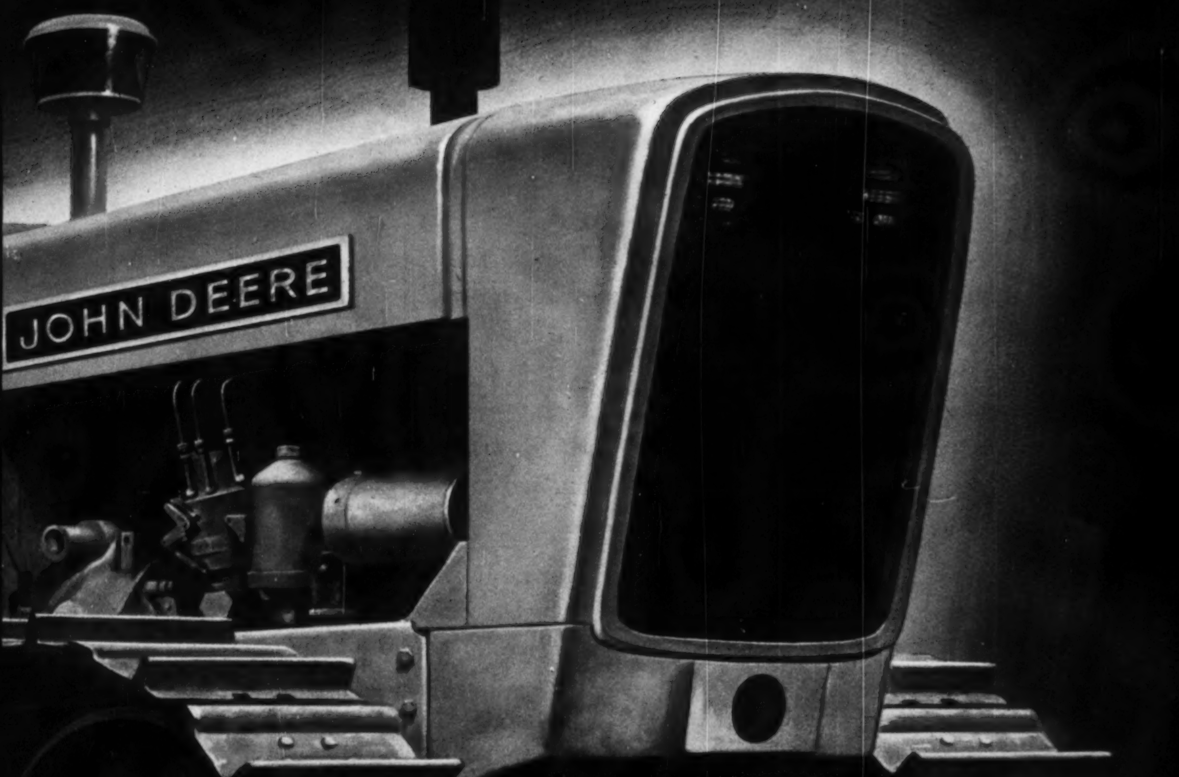
FIND OUT TODAY HOW TELEPATH CAN IMPROVE YOUR SHORT RANGE COMMUNICATIONS!

Write for name of nearest TELEPATH dealer, and complete information on versatile TELEPATH communications.

SEISCOR
A DIVISION OF SEISMOGRAPH SERVICE CORPORATION
BOX 1590, TULSA, OKLAHOMA

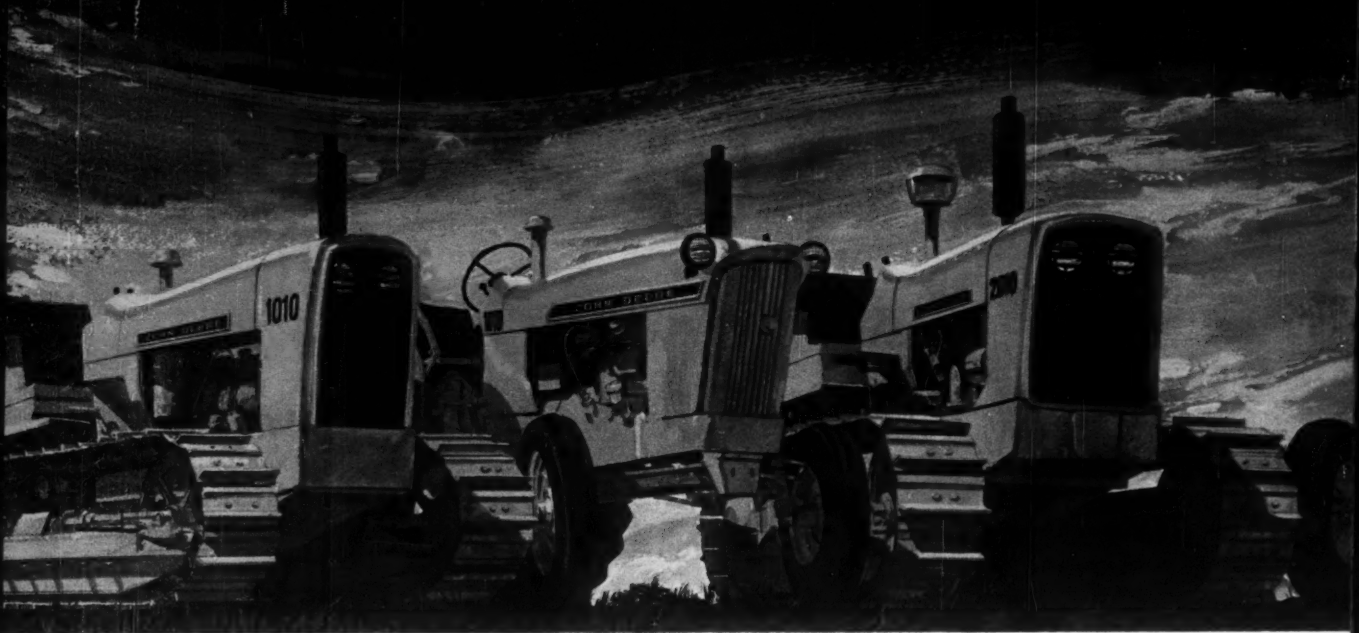
Announcing: **a**

NEW GENERATION of POWER



a NEW GENERATION

1010 · 2010 · 3010 · 4010 Tractors



New tractors and attachments! New ideas in design and manufacture! Six completely new tractors, ranging in size from 40 to 85 engine horsepower will be offered with the Ten-Ten series first off the line. New tractor loaders, bulldozers, backhoes, and a variety of other equipment give the fleet owner and single-unit operator more to work with . . . more to profit by.

John Deere engineers threw away the book to bring you these new power units. Years of research, development, and testing have combined the best proved engineering principles with some of the freshest ideas in the industry today. The New Generation of Power is here!

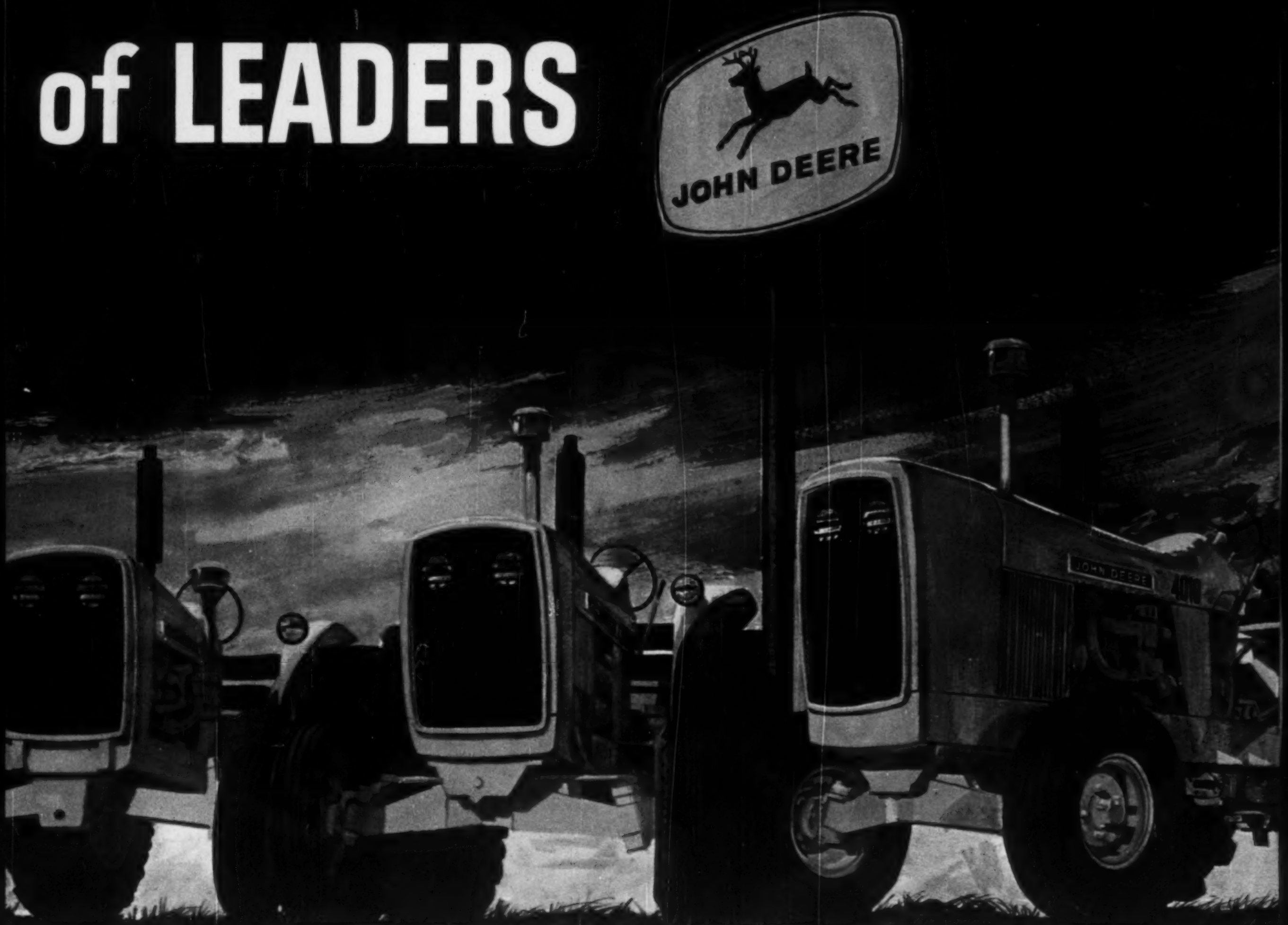
High Productivity

More usable horsepower in each tractor size—that's the advantage earthmoving contractors, pit operators, landscapers, and construction men will find in Deere power. More usable horsepower means more work per dollar invested. Coupled with fresh engineering approaches on operator efficiency, comfort and convenience, you'll speed production on a wider range of jobs.

Balanced Performance

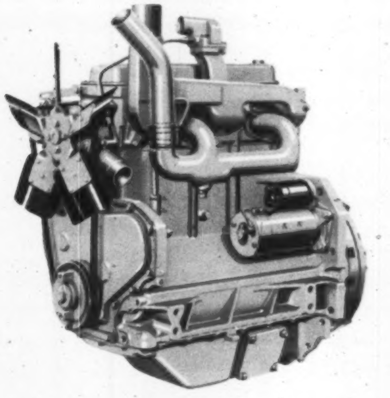
John Deere power—usable power—is day-in, day-out performance. Tractors, engines, transmissions are quality-made for full-day productivity, day after day, on job after job. Their hydraulic systems are pressure-stressed to handle continuous maximum loads without fatigue. In every respect, you can count on cost-cutting performance in this New Generation of Leaders.

# of LEADERS



New power for profit

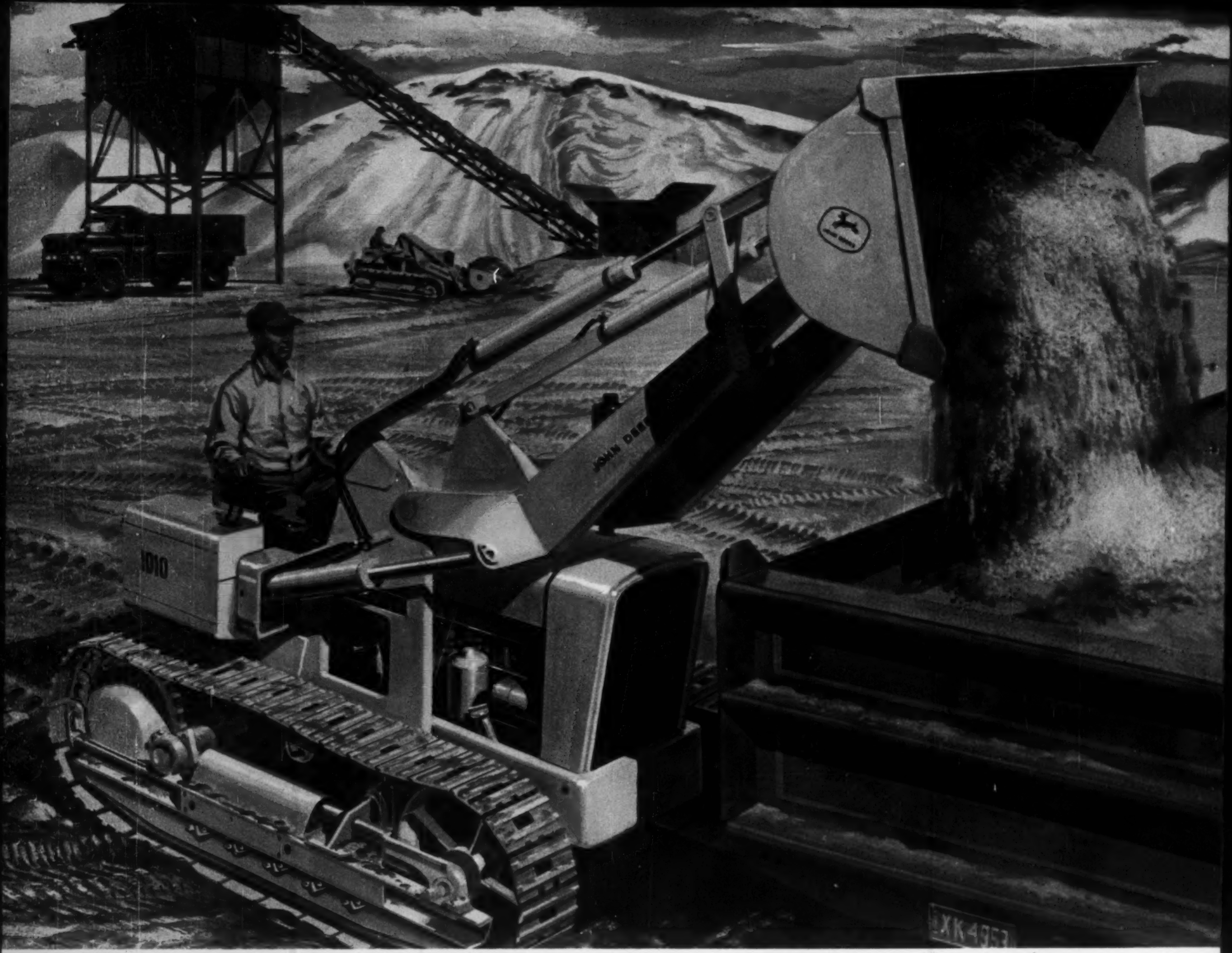
with John Deere's wide-range power concept



Gasoline or Diesel • 4 or 6 cylinders

Completely new tractor engines, Deere designed and built, provide a new kind of performance—wide-range power—for every construction use. True variable-speed engines offer flexible, efficient power throughout the full throttle range. Coupled with transmissions providing a wide range of application-matched speeds, these new 4- and 6-cylinder engines put the new John Deere power train far ahead in horsepower efficiency, lugging ability and balanced performance.

There is big news in hydraulic power, too. Pump designs include an advanced type new to the earthmoving industry. Plenty of pump capacity, plenty of smooth, responsive hydraulic power insures efficient operation on every job.



Choose from 2 new Crawler Loaders or

For any application *. . . Excavating, loading, material handling—name your job, and you'll find the right unit for it in the all-new John Deere loader line. You'll gain new operator efficiency, too, with improvements such as one-lever boom and bucket control.*

Powered right for high performance, the John Deere Ten-Ten Crawler-Loader meets all modern demands for a versatile, efficient unit in the 40 engine h.p. class. Sixty-six inch bucket has a rollback of 40 degrees, 8500 pounds breakout force, a full-height lifting capacity of 3500 pounds, and a dumping clearance of 8 feet, 1 inch. The Ten-Ten Crawler-Loader has a 3/4-yard bucket with 8 nodular iron teeth and is available with gasoline or Diesel power.

With extra capacity for top production, the all-new Twenty-Ten Crawler-Loader combines the 50-h.p. John Deere gasoline engine with a one-yard bucket. Fast cycle time is assured by the 40-degree rollback of the 66-inch bucket, 8500 pounds breakout, 3500-pound full-height lifting capacity and a 7-foot, 11-inch dumping clearance. Eight nodular iron bucket teeth speed excavating work in rock, frozen ground or other difficult operating conditions.

4 Wheel Loaders for greater job profits

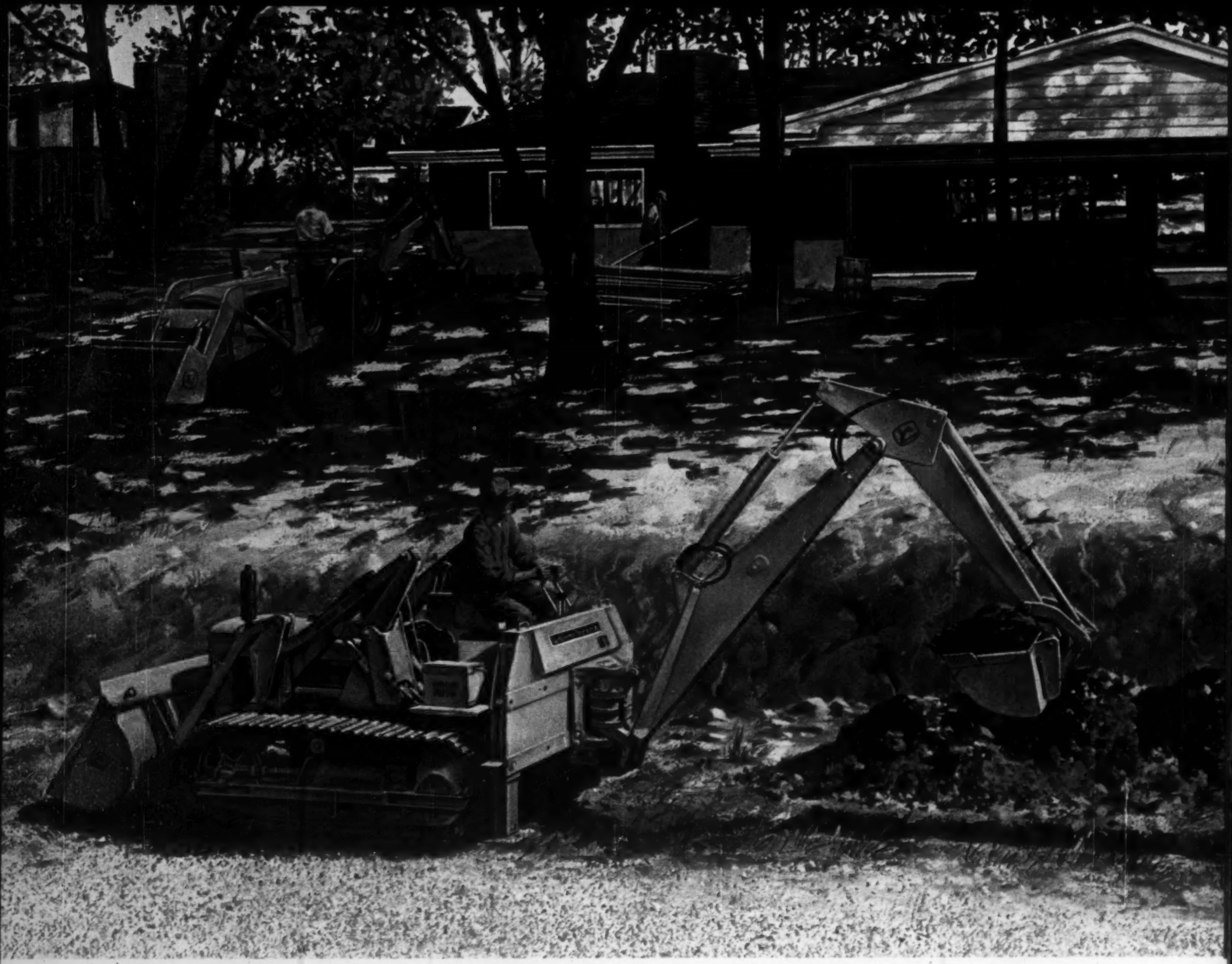
A wide range of power matched bucket sizes, each with plenty of dumping height and pry-out power assures you the kind of loading performance you need. Whether your job calls for tracks or wheels, choose John Deere for new power and high productivity.

Valuable on any job, the compact 701 Loader for John Deere Ten-Ten Wheel Tractors has a standard 3/8-yard bucket, four feet in width, with a 20-degree rollback providing 4800 pounds of breakout force, 2000 pounds full-height lift capacity, and a dump clearance of 102 inches.

Low-cost loading is yours with the economy priced 700 Loader which mounts on either Twenty-Ten or Thirty-Ten Wheel Tractors. Bucket size is 5/8 yard. Breakout force is 4800 pounds, full-height lift 2000 pounds and maximum dumping clearance, 102 inches.

Single-lever control on the 720 Loader for Twenty-Ten and Thirty-Ten Wheel Tractors speeds operation. The 720 Loader has 6650 pounds pryout pressure, 3500 pounds full-height lift effort, and clears 99-1/2 inches for dumping. Buckets are 5/8 and 7/8 yard.

30-degree rollback gives the 740 Loader for the Forty-Ten Wheel Tractor 6650 pounds of pryout. Bucket capacity is 7/8 yard and lift effort, 3500 pounds at full height. Dump clearance is 99-1/2 inches. The loader frame is designed to accommodate rear-mounted backhoes.



Increase trenching versatility

with a John Deere 50 or 51 Backhoe

Team the new power, handling ease and mobility of John Deere Tractors with the field-proved performance of either the 50 or 51 Backhoe! You'll take advantage of every benefit of John Deere's new advances in engine power and hydraulics, plus the greater trenching versatility these units provide. Ease of operation and quick adaptability to working conditions are your assurances of low-cost trenching for soil pipe, foundations and cable laying.

2-Lever Control. Efficient 2-lever control of boom, dipper stick, and bucket, a widely preferred feature on John Deere Backhoes during the past two years, is yours again with any backhoe combination in the line. Eliminates excess hand motion throughout a long working day; helps operator do fast, precision work.

5-Position Digging. The John Deere 51 Backhoe digs flush right or left against walls, fences or buildings. The rotary boom cylinder centers or slides to any of four off-center positions along the mounting, moved by the unit's own hydraulic power. One man with a wrench easily makes the switch in minutes right on the job.

1010
JOHN DEERE
624

Take your pick from 5 all-job crawler bulldozers

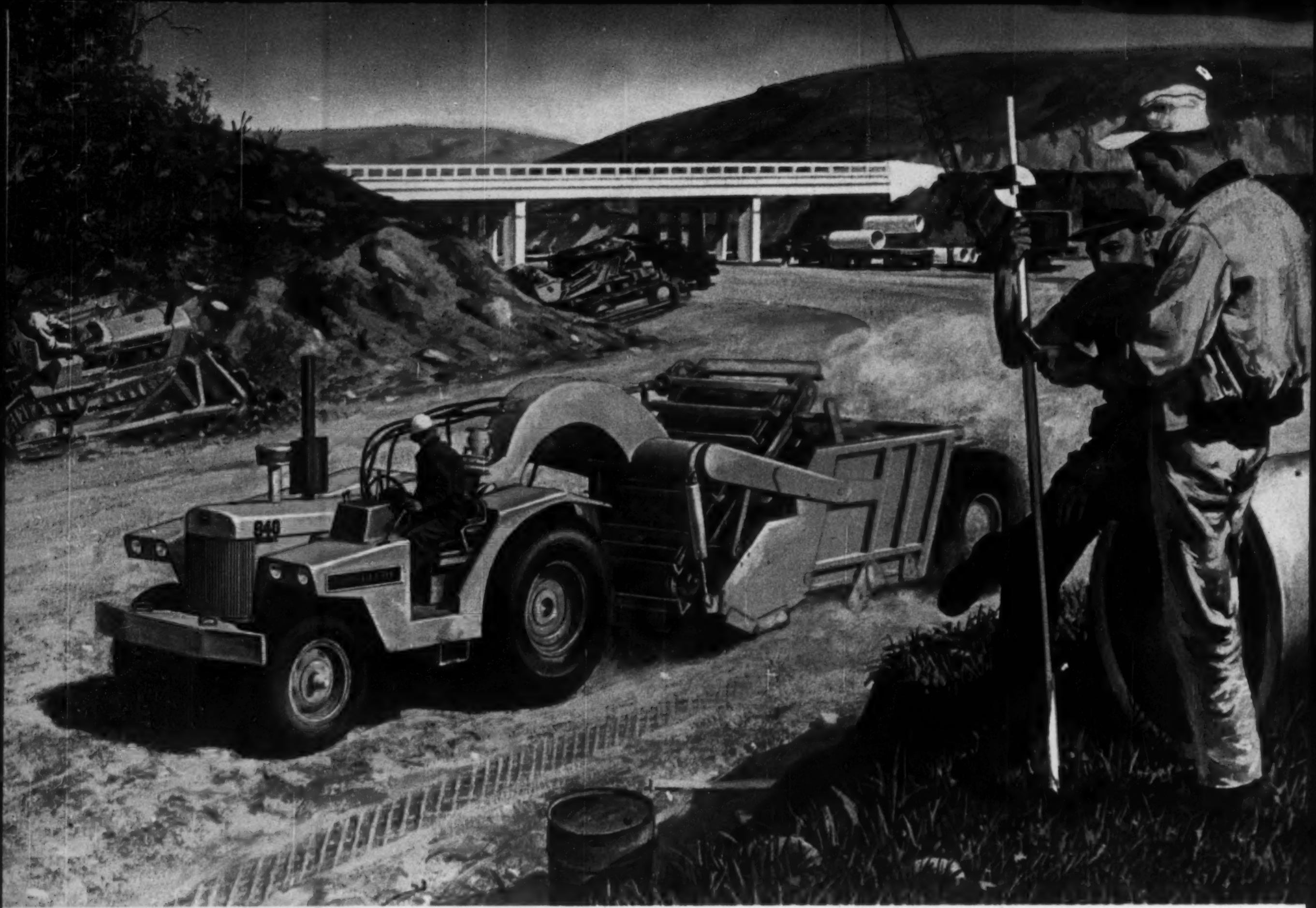
Need a blade for heavy pioneering, road building, or precision finish grading? John Deere has it! Five outside- or inside-mounted dozers, sized right and power matched for your needs, are included in the new line. All-hydraulic models with power tilt, angle, and cut are now operated by new single T-bar control. Operator moves control to the position he wants and the blade repeats the motion! Just one of many new ideas throughout the whole line!

For clean work at low cost, select the John Deere Ten-Ten Crawler with 610 inside-mounted Dozer. Available with 72-inch or 90-inch blade with three-piece cutting edges. Angles 18 and 25 degrees right or left, cuts to 12 inches below track level, and lifts as high as 40 inches.

Power plus flexibility is yours with the John Deere Ten-Ten Crawler and all-hydraulic 612 Dozer. Change tilt, angle or cut on the go with one control! Inside mounted, with 80-inch blade.

For big work savings, the 624 outside-mounted Dozer mounts on either the Ten-Ten or Twenty-Ten Crawler. Blade is 90 inches wide, 23 inches high with three piece cutting edge. Cuts as deep as 12 inches below track level, and is easily set to angle 25 degrees right or left. Lift is 48 inches.

Pair the extra power of the Twenty-Ten Crawler with new inside-mounted 620 or 622 Dozer. Choose from 72-, 80- or 90-inch blades with hydraulic lift or full hydraulic operation.



Dependable John Deere diesel power, teamed with a versatile elevating scraper, provides a widely preferred earthmoving combination for road and street work, land forming, and stripping overburden.

PARTS and SERVICE

Parts and service for any John Deere Tractor are always available from your nearby John Deere dealer. He and his service crew know how to service and maintain construction equipment with minimum downtime expense. Find out how this man can help you now. Check with the classified telephone directory or write John Deere, 3300 River Drive, Moline, Illinois.

JOHN DEERE CREDIT PLAN

All tractors and equipment can be purchased on terms of the John Deere Credit Plan. Arrangements are made in strict confidence by your dealer. Terms are tailored to individual requirements. Protective life insurance and property insurance are also available at low cost.

LEASING PLAN

Throughout the United States, three to five-year leasing arrangements can be made through your John Deere dealer. The plan is specifically designed to enable contractors and others to obtain profitable use of the most modern, efficient equipment, without affecting needed working capital.

LITHO IN USA

JOHN DEERE Earthmoving Logging Landscaping and Material Handling Equipment

JOHN DEERE

comparison, BPR decided to use the most conservative rating method, the net intermittent-duty horsepower with deductions for all accessories. They were aware, however, that horsepower alone does not determine the workability of the blade. Other factors—weight distribution, general machine balance, transmission type and gear train efficiency—play an important role. For this reason they decided that the only practical way to determine a performance rating for motor graders was to measure the tractive effort or blade pull available at the moldboard through a reasonable range of travel speeds.

A series of conferences was held with representatives of all motor grader manufacturers and with representatives of federal agencies that use the machine. From these conferences BPR was able to set up a list of requirements for machine performance.

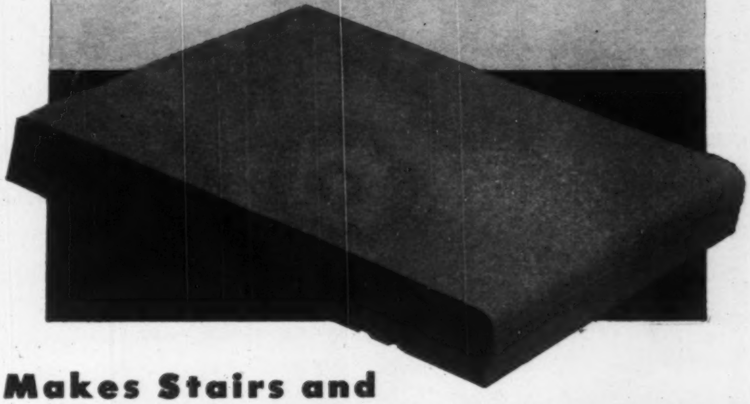
Actual testing was on a concrete-paved test course, to insure a true comparison of available power.

Specification requirements will be set for speeds of from 2 to 10 mph with a speed of 3 mph being taken as a basis for horsepower comparison.

The Federal specification will not limit itself to horsepower and rate requirements. Among other specification requirements:

- Minimum lean of front wheels on tandem drive graders of 15 deg. right and left from the vertical.
- Moldboard rotation of 360 deg. for all but smallest grader.
- Ground level blade positioning for a minimum 45 deg sloping angle from center-of-tire to center-of-tire.
- Operation of moldboard through normal operating ranges from the operator's seat.
- A maximum bank cutting angle for the moldboard of 90 deg on the right and 80 deg on the left.
- A minimum speed for raising and lowering the moldboard of 2 in. per second.
- Engine exhaust smoke must not be darker than light grey.
- Engine cooling-system efficiency must be such that after a sustained pull of 10 min. at maximum power output, the difference between air temperature and cooling system water temperature will not exceed 85 deg F through an air temperature range from 50 deg F to 90 deg F.
- The service brake must be capable of stopping a grader traveling at 15 mph within 25 ft on a dry, level concrete surface.
- Parking brake must be capable of locking the grader wheels on a 20% slope uphill or downhill.

For a LIFETIME of Walking Safety
ALUNDUM
STAIR and FLOOR TILE



Makes Stairs and Floors PERMANENTLY Non-Slip!

ALUNDUM stair and floor tiles, which have long been acknowledged by architects as providing the maximum obtainable combination of non-slip effectiveness (wet or dry) and resistance to wear, are again available from Norton Company. Installations the country over have proved conclusively the ability of ALUNDUM tiles to provide walking safety, year after year, under the most heavily concentrated foot-traffic conditions.

The extremely hard, tightly bonded ALUNDUM abrasive structure (65-80% abrasive) makes stair nosings, vital walkways and ramps permanently non-slip and with a surface free from grooves and corrugations that can catch heels and cause tripping.

The *stair type* is recommended as a nosing for marble, tile, terrazzo, concrete or steel stairways. The *floor type* is designed for use with step nosings or on any ramp or flat walking surface.

Send for catalog on Norton products for WALKING SAFETY. Ask for form 1935ER

ALUNDUM stair and floor tile is providing walking safety and durability on stairways, at turnstiles and along platform edges of the Chicago subways.

NORTON
NON-SLIP FLOORS

NORTON COMPANY
WORCESTER 6, MASS.

ALUNDUM AGGREGATE for Terrazzo and Cement • ALUNDUM STAIR and FLOOR TILE
ALUNDUM and CRYSTOLON Non-slip Abrasives

Here is Your Guide to
LARGE FASTENERS
HEX, SQUARE AND SOCKET HEAD BOLTS
HEX, JAM AND SQUARE NUTS
THREADED AND LOOP RODS
RECESSED PIN NUTS AND PINS
HEX AND SOCKET HEAD CAP NUTS
COUPLING AND SLEEVE NUTS
PILOTS AND DRIVING NUTS
BRIDGE SOCKETS
TURNBUCKLES
CLEVISES
DYSON

Now you can meet all your large fastener requirements quickly, easily, from one dependable source. Bulletin 160 describes the complete line of large fasteners of every description mady by this 88-year old manufacturer. Forged for greatest resistance to impact and shock, these fasteners cut costs on bridges, power plants, docks, heavy machinery, dams, locks, etc. Send for your copy today. Write for Bulletin 160, Joseph Dyson & Sons, Inc., 5125 St. Clair Avenue, Cleveland 3, Ohio. 'Phone HE 1-6157.

Size: 1 3/4" thru 12" bolt diameter

DYSON

Clinch River Atomic Waste Surveyed by Eight Agencies

Eight state and federal organizations have combined to conduct a study on radioactive wastes in the Clinch River downstream from the Oak Ridge National Laboratories, Oak Ridge, Tenn.

Its objective is to find out what happens to radioactive materials released to the river and to evaluate the detailed physical, chemical and biological phenomena involved.

How river plant and animal life are related to the ultimate distribution of radioactive materials is another aspect of the test. Aquatic biology will be studied in this phase.

The study will broaden an existing Atomic Energy Commission program primarily concerned with health and safety aspects of release of low-level radioactive waste solutions to the river. ORNL will continue its current program to assure that concentrations of radioactive material in the river are below established limits for drinking water.

Organizations involved in the study are: AEC, ORNL, the U. S. Public Health Service, the U. S. Geological Survey, the Tennessee Game and Fish Commission, Tennessee State Health Department, Tennessee Stream Pollution Control Board and the Tennessee Valley Authority.

Test for Metal Wastes Cuts Laboratory Time 90%

General Motors Corp's Truck and Coach Division reports a fast and accurate new test for detecting the concentration of metals in plating wastes. It combines chemical and spectrographic techniques.

The new method is more accurate than hand testing and takes only a tenth as long, according to the company's chief chemist, Frank L. Racine. He says the test is used now to determine the copper, zinc and nickel contents in waste effluents but has a potential for other metals.

As described by Mr. Racine, the test starts with the addition of lithium nitrate to a sample of waste effluent. The sample is then evaporated and the remaining salts burned electrically in the spectrograph. A filmed record of the light from the burning salts enables laboratory technicians to determine the amount of each metal in the sample.

In the company's present waste-control procedure, samples of waste are taken several times a day at three check points and later turned over to the laboratory for analysis.

EXTRA SAFETY UNDERFOOT in this New Glass Plant . . . with KERRIGAN *Weldforged* Grating & Treads!

TWISTED **Cross Bars** ***ALTERNATE*** **right & left for an** ***EXTRA*** **margin of Walking Safety**

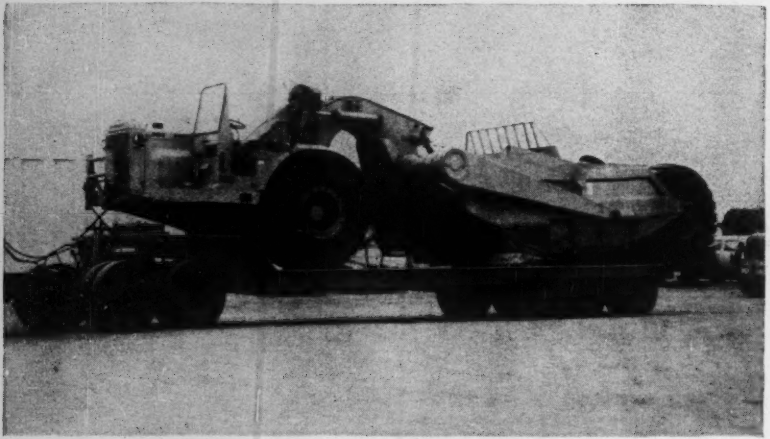
When you specify Kerrigan Weldforged grating you get the utmost in underfoot and underwheel safety . . . in addition to its well known economy features. Bearing bars, and cross bars that alternate right and left, are electronically weld-forged into inseparable, one-piece units that stand up under the severest kind of punishment.

Get the engineering facts!
Write now for FREE catalog.
Address: Dep't E-9.

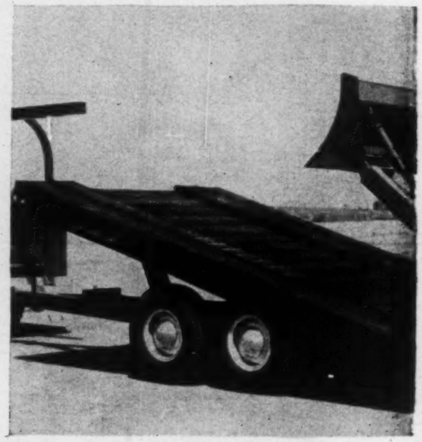
KERRIGAN
IRON WORKS COMPANY
Nashville, Tennessee

Other KERRIGAN Products: GREULICH 4-Way Grid, Street & Highway Lighting Standards!

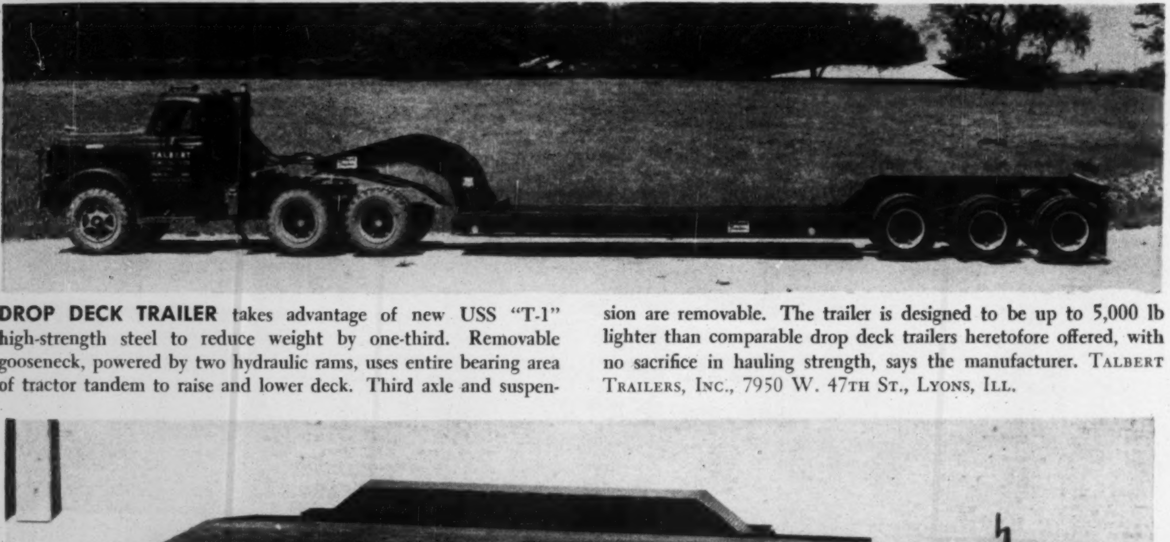
Trailers: More Versatile, Lighter,



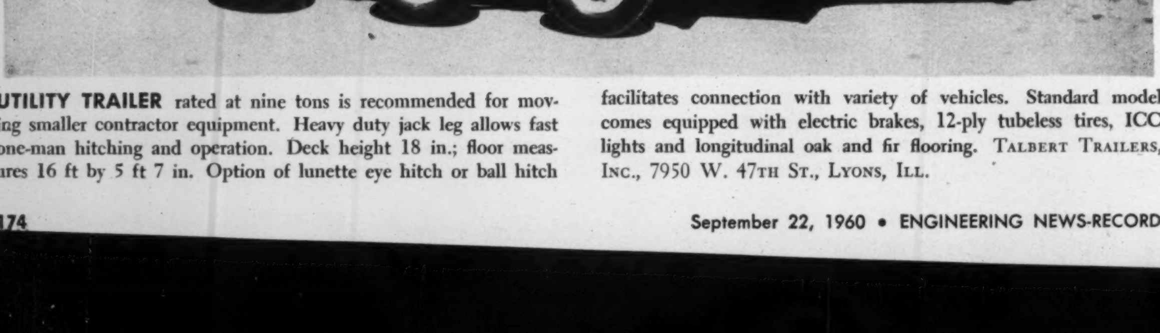
THREE AXLE LOW-BOY uses single point suspension to assure equal load distribution on all axles regardless of where load is placed on the trailer bed. Stabilizer bar attached to the front axle provides positive alignment of three-axle unit. In 30-, 40- and 50-ton units by LaCrosse Trailer Corp., Box 857, LaCrosse, Wis.



TILT-BED TRAILER has five-ton capacity when equipped with 8 x 14.5-in. 12-ply tires. Rubber-mounted axles eliminate springs, shackles and shock absorbers—mak-

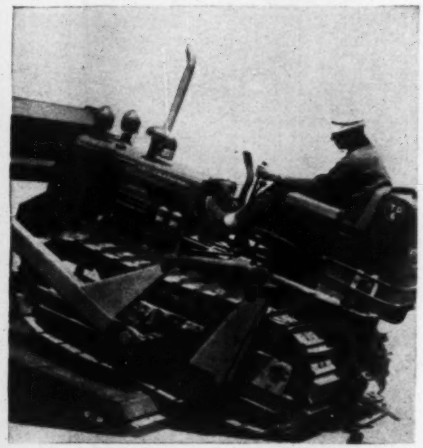


DROP DECK TRAILER takes advantage of new USS "T-1" high-strength steel to reduce weight by one-third. Removable gooseneck, powered by two hydraulic rams, uses entire bearing area of tractor tandem to raise and lower deck. Third axle and suspension are removable. The trailer is designed to be up to 5,000 lb lighter than comparable drop deck trailers heretofore offered, with no sacrifice in hauling strength, says the manufacturer. Talbert Trailers, Inc., 7950 W. 47th St., Lyons, Ill.

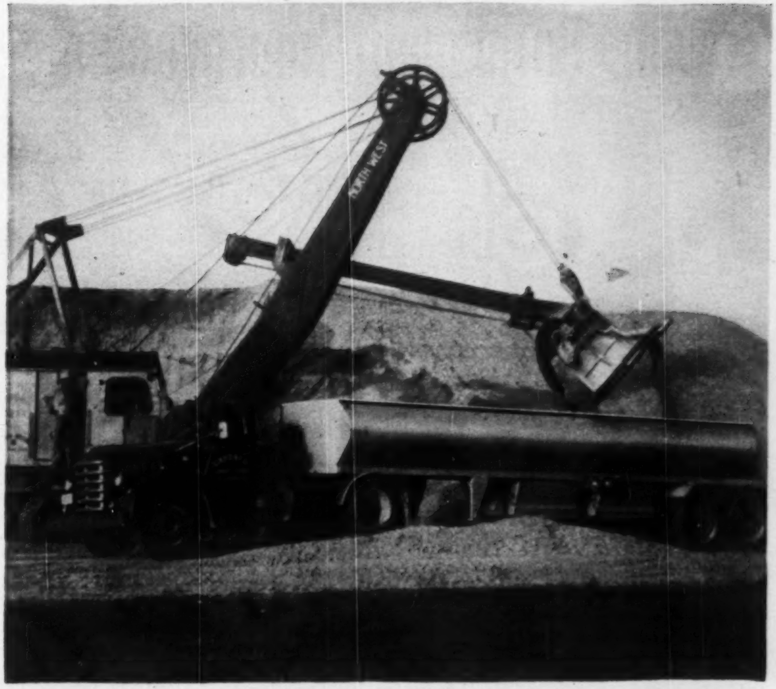


UTILITY TRAILER rated at nine tons is recommended for moving smaller contractor equipment. Heavy duty jack leg allows fast one-man hitching and operation. Deck height 18 in.; floor measures 16 ft by 5 ft 7 in. Option of lunette eye hitch or ball hitch facilitates connection with variety of vehicles. Standard model comes equipped with electric brakes, 12-ply tubeless tires, ICC lights and longitudinal oak and fir flooring. Talbert Trailers, Inc., 7950 W. 47th St., Lyons, Ill.

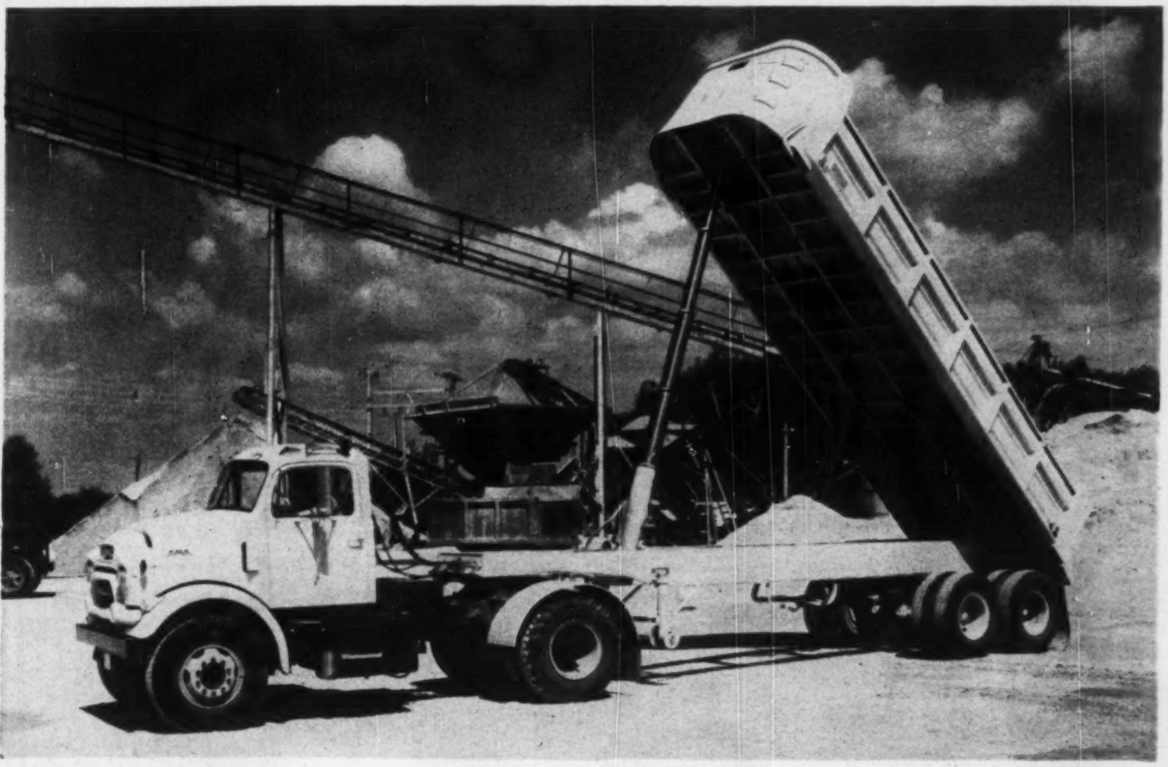
Stronger



ing lubrication unnecessary. Platform slam is eliminated by hydraulic cylinder. International Harvester Co., 180 N. Michigan Ave., Chicago, Ill.



BOTTOM DUMPER for dry bulk materials comes in aluminum or steel. Twenty-two-cu-yd closed-top model loads through three 20-in. hatches. Open-top unit carries up to 30 cu yd. Curved walls are part of the load-carrying structure and help reduce weight. Freuhauf Trailer Co., Detroit 32, Mich.



REAR DUMP TRAILER uses inch-deep "V" corrugations and completely boxed top roll sections to provide rigidity while cutting weight. Unit is engineered to eliminate longitudinals by transferring hoist force through the front sheet to the body sides. Model "XL" (pictured) is manufactured in standard lengths from 16 to 28 ft with a capacity range of 10 to 35 cu yd. Axle combinations can be specified to comply with existing state weight laws. Galion All-steel Body Co., Galion, Ohio.

Provide Permanent Improvement?

GALVANIZED
OR PAINTED

USF

BRIDGE FLOORING

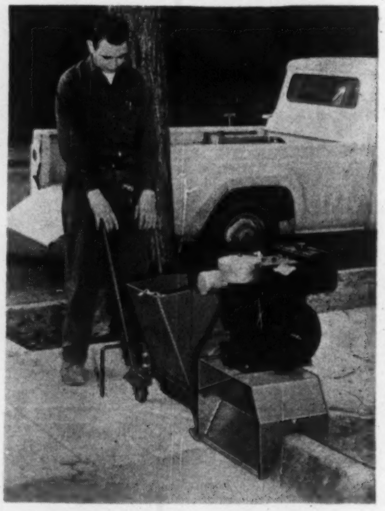
for bridges, overpasses,
backing for piling

Economy and maintenance minded budgets suggest consideration of permanent durability, engineered strength and low cost maintenance free service provided by this proven highway material. Send for free design manual.

Highway Guard Rail
Bridge Flooring
Steel Forms for Concrete Bridge Decks
Corrugated Metal Pipe
Window Wells
Metal Doors & Frames
Metal Buildings

USF

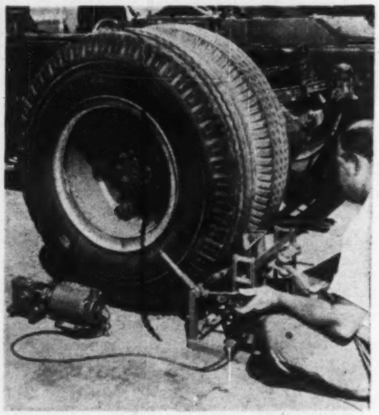
United Steel Fabricators, Inc. Wooster, Ohio



Bituminous Curb Machine Moves at 4 ft per Minute

The F&H Model 60 bituminous curb machine is credited by its manufacturers with being able to lay curb at the rate of 4 fpm in any contour desired up to 6 in. maximum height and 8½ in. maximum width.

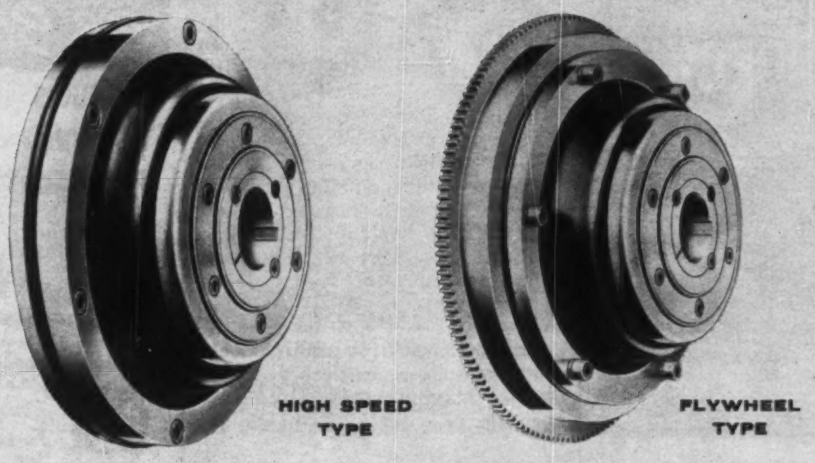
The machine weighs 340 lb, is 32 in. high, 63½ in. long, 19 in. wide, including its handle. F&H PRODUCTS CO., 1531 WASHINGTON AVE., PIQUA, OHIO.



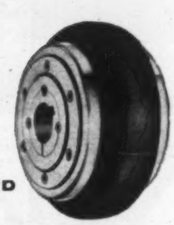
Machine Regrooves Tires While They Are on a Truck

Tires can be regrooved without being removed from a truck with the Honeycutt Truck Tire Regroover.

The Honeycutt regroover is a small, portable, two-unit machine in which one unit spins a jacked-up tire while the other unit cuts grooves in the shoe. A pin guide riding in adjacent grooves simplifies following the original groove pattern. HONEYCUTT TOOL MANUFACTURING CO., 315 AUSTIN STREET, HOUSTON 2, TEXAS.

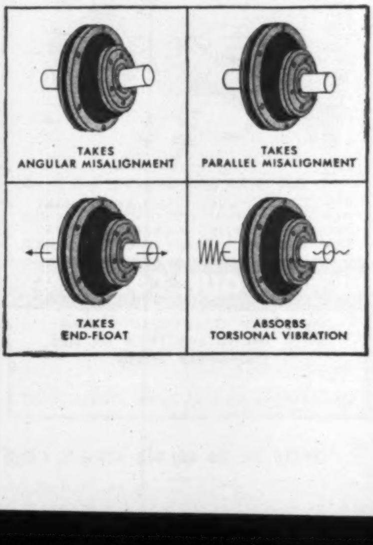


NOW! THE COUPLING WITH THE 4-WAY FLEX IN TWO NEW TYPES — HIGH SPEED AND FLYWHEEL



STANDARD TYPE

THE 4-WAY FLEX OF PARA-FLEX


TAKES ANGULAR MISALIGNMENT
TAKES PARALLEL MISALIGNMENT
TAKES END-FLOAT
ABSORBS TORSIONAL VIBRATION

DODGE Para-flex

Industry asked for this—and here it is! Dodge Para-flex, the unique coupling that swallows up misalignment, is now available for high speed applications, and for high torque at either high or low speed.

The new Dodge High Speed Para-flex is specially designed for operation with motors and internal combustion engines that turn up to 5230 rpm.

The new Flywheel Para-flex, with the same capabilities, has a flexing element that bolts directly to the flywheel of internal combustion engines.

Like the Standard Type (with capacities up to 2000 hp at 1080 rpm) these new Para-flex Couplings feature a modern, tire-like flexing element that handles angular and parallel misalignment, end-float (or any combination) and absorbs torsional vibration. The amazing performance of Para-flex Couplings is a matter of record in thousands of installations.

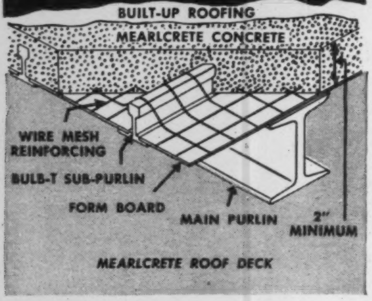
Ask your Dodge Distributor—or write us for new technical bulletin.

DODGE MANUFACTURING CORPORATION
6900 Union Street, Mishawaka, Indiana

DODGE
of Mishawaka, Ind.

CALL THE TRANSMISSIONEER—your local Dodge Distributor. Factory trained by Dodge, he can give you valuable help on new, cost-saving methods. Look under "Dodge Transmissioneer" in the *white* pages of your telephone directory, or in the yellow pages under "Power Transmission Equipment."

MEARLCRETE
insulating
ROOF DECKS



fast

Place up to 30,000 square feet of roof deck or insulation in a single day.

lightweight

Permits savings on structural steel frame!

economical

Competitive with all other systems!

Pumped into place as insulating fill on galvanized corrugated steel decks, or as roof decks on form boards, Mearlcrete Foam Concrete offers many advantages over other systems. Here are a few:

CONTROLLED QUALITY — Mearlcrete is installed only by franchised trained contractors.

INCOMBUSTIBLE — 100% concrete reduces heat flow and flame spread.

LOW WATER CONTENT — Less than other poured decks...dries rapidly... pemits faster construction schedules.

HIGH INSULATING VALUE — Reduces initial cost and operating cost of heating and cooling plant.

WRITE FOR TECHNICAL BULLETIN R411A
with complete data on Mearlcrete Foam Concrete and the name of your local Mearlcrete contractor.

MEARL chemical corporation
220 Westfield Ave. West, Roselle Park, N.J.
CHestnut 5-9500

CIRCLE 178 ON READER SERVICE CARD

Portable Kit Speeds Repairs to Pipe in Field

Permanent repairs to pipe and tubing, pipe joints and fittings, and tanks can be made in the field with the "Util-Seal" portable repair kit, its maker says. It is recommended particularly for minor repairs in hard-to-reach places.

The kit contains individual portions of resin, activator and fibrous reinforcer, as well as a collector ring and pressure relief vents for use during the "setting-up" period. Packages are designed to eliminate guesswork in combining correct proportions.

The maker says that the materials meet requirements for regular maintenance as well as emergency repairs. Dresser Manufacturing Div., Bradford, Pa.

Pump Is Designed for Swimming Pool Service

A new general service pump, Marlow's Model 2AA1-B, is designed to deliver 7,800 gph. Swimming-pool service companies and contractors can use it for vacuum cleaning, pump outs, fast fills and dewatering.

Pump has 2-in. male threaded suction and discharge connections and a three-position discharge. A Briggs & Stratton eight supplies power to the pump. Standard unit is wheel mounted. It incorporates a new type strainer with stainless steel basket for use when vacuum cleaning. A regular strainer is included for ordinary dewatering. Marlow Pumps Div., Bell & Gossett Co., Midland Park, N. J.

Air, Dust Sampler Aids In Testing for Pollution

An instrument designed to collect air samples automatically for subsequent air-pollution analysis can be used for either gas determination or dust counting, says the manufacturer.

Operation of the portable instrument is simple. A vacuum pump is connected to a special 12-position valve. This valve in turn is connected to 12 gas collectors or filter holders. The valve is automatically switched from one position to the next so that 12 samples of air are collected in sequence. At the end of 12 samplings the device shuts itself off.

Filter holders may be used with the sampler for collecting dust samples or midget charcoal traps for collecting gas samples. Refrigerator traps can also be used. Gelman Instrument Co., Box 86, Chelsea, Mich.

POSEY
WORKS
FOR BETTER-

IROQUOIS
ASPHALT
PLANTS

Complete
batch type
Asphalt plants with capacities from 50 to 240 tons per hour — hot-cold mix. New automated design enables complete plant to be operated by one man.

For FREE 22-page illustrated catalog, write:

POSEY IRON WORKS INC
Custom Fabrication For Over 50 Years

DIVISIONS:
- Iroquois Asphalt Plants
- Mixers and Blenders
- Tunnel Forms
- Industrial Heating
- Foundry
- Large OD Steel pipe

561 S. PRINCE STREET LANCASTER, PA.

CIRCLE 22 ON READER SERVICE CARD

sand-cement product of the CEMENT GUN®

Forty-seven years as GUNITE specialists

Call us for information and bids

PRE-STRESSED TANKS STEEL ENCASEMENT
RESERVOIR LININGS REFRACTORY LININGS
PRESSURE GROUTING CONCRETE REPAIRS
SAND-BLASTING STACK & BUNKER LININGS

CEMENT GUN COMPANY

Gunite® Contractors and sole manufacturers of the CEMENT GUN®

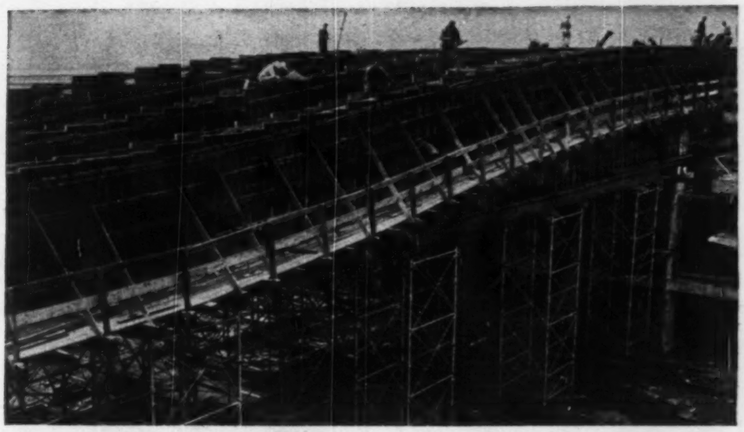
General Offices, Allentown, Penna. HEmlock 2-1002

CIRCLE 30 ON READER SERVICE CARD

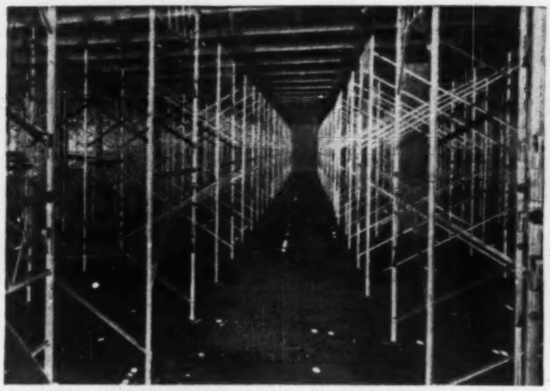
Shoring Methods

for concrete construction

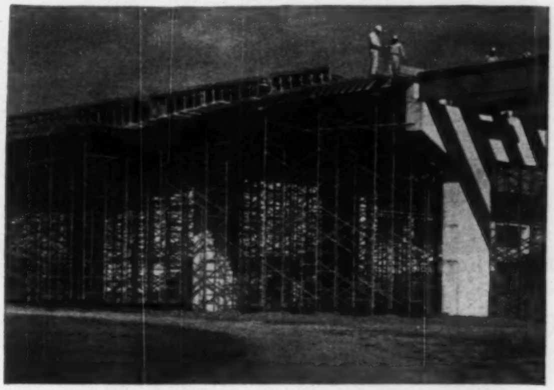
. . . by Patent Scaffolding CO.



EXTRA HEAVY DUTY SHORING Rolls to Pours—Mounted on a traveller, each Extra Heavy Duty Shoring set-up supports two of 16 clear-span concrete girders from 7'8" to 8'8" deep, 2' to 2'10" wide, and 125' long, at Eastern Airlines Terminal Bldg., Idlewild Airport, N.Y. Gilbane Building Co., gen. contr., pours a pair of girders, lowers shoring and rolls it to new positions.



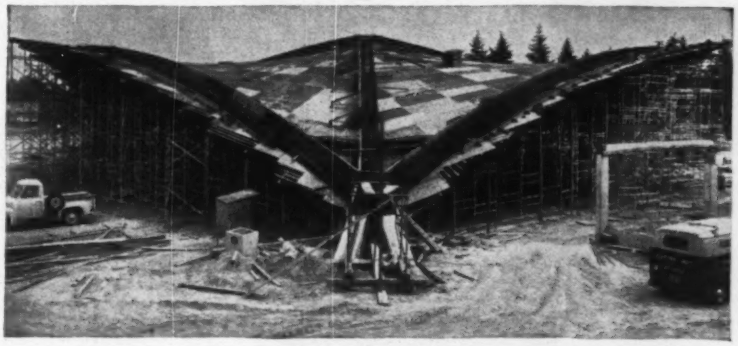
STANDARD SHORING Meets Most Job Needs—Standard "Trouble Saver" Shoring 5'-wide frames are assembled rapidly to provide safe, ample support for pan construction of the Atomics International Project, Canoga Park, Calif. Shoring supports 30" x 30" x 14" domes with 4½" slab. C. L. Peck Construction and Realty Co., general contractor.



NEW HEAVY DUTY SHORING Supports Bridge—Safe support for the heavy loads imposed by this concrete overpass in San Jose, Calif., is provided by new PS Co. 4'-wide Heavy Duty Shoring frames, tested under simulated field conditions to safely support loads up to 10,000 lbs. on each leg. General contractor, Oscar C. Holmes.

STANDARD FRAMES SHORE HYPERBOLIC PARABOLOID STRUCTURE—

On the new auditorium for Edward S. Ingraham H. S., Seattle, Sound Construction Co., general contractor, uses 1300 standard "Trouble Saver" Shoring frames to support dome and slab formwork for this concrete hyperbolic paraboloid structure. Design involves three anchors, set 161' apart, from which three center beams, 2'6" x 4", arch to 35' high. Two perimeter beams per anchor fan out and intersect at 28' high.

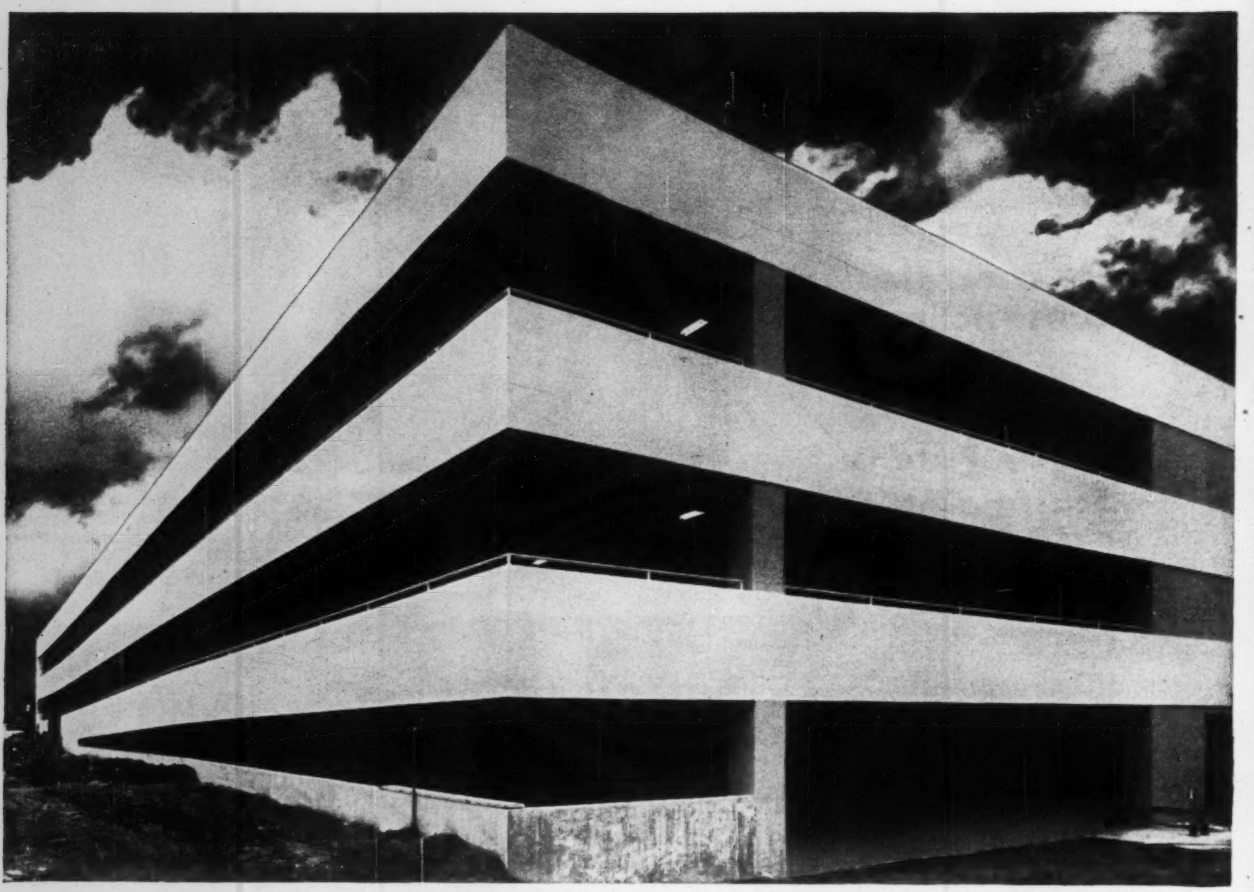


THE PATENT SCAFFOLDING CO., Inc.

38-21 12th Street, Dept. ENR, Long Island City 1, New York
1550 Dayton St., Chicago 22 • Branches in all principal cities • 6931 Stanford Ave., Los Angeles 1
IN CANADA: CANADIAN PS CO., 329 DUFFERIN ST., TORONTO

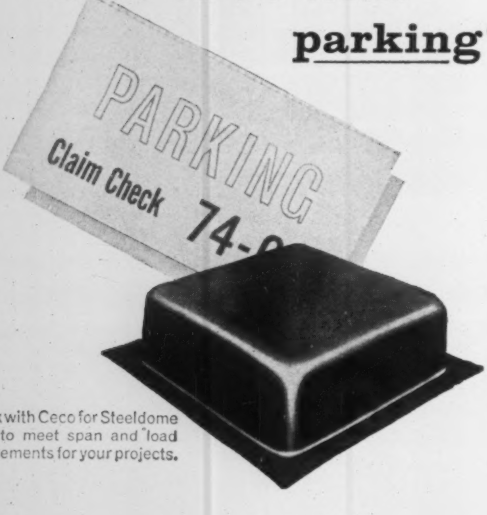
Complete scaffolding equipment and engineering service offered through nation-wide sales offices or representatives. Look under Patent Scaffolding in the Yellow Pages for your nearest source.

SALES RENTALS



The Texas Company Parking Structure, Los Angeles, California. Architect: Welton Becket and Associates. Contractor: Del E. Webb Construction Co.

What do steeldomes have to do with parking?



Check with Ceco for Steeldome sizes to meet span and load requirements for your projects.

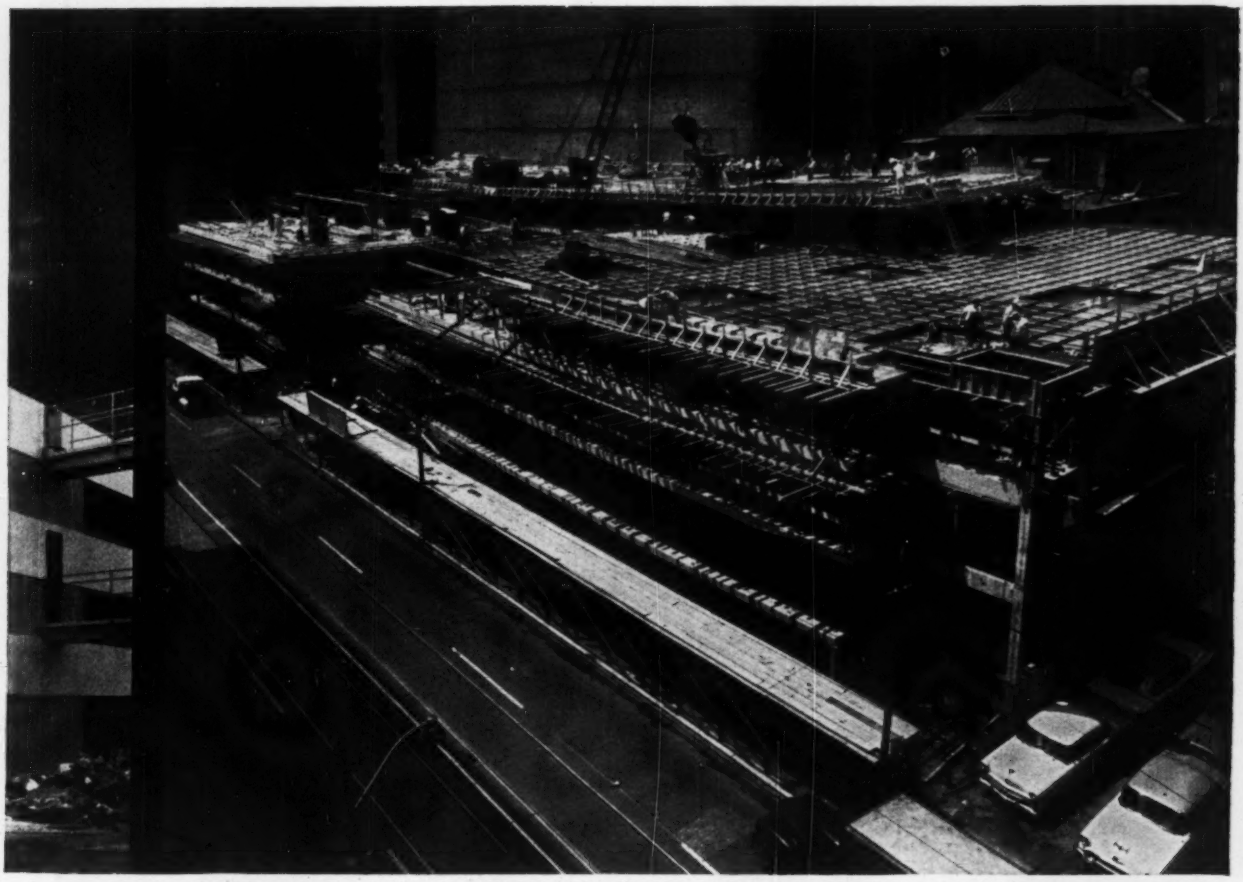
Plenty—since they provide more floor space for cars

With the ever-increasing number of automobiles today, there's always the matter of parking. Many firms have solved the problem by building extra space into their parking structures. How? By using a new but proven building process—Ceco's two-way Steeldome construction. This method of floor and roof framing requires fewer columns, resulting in wider spans and more open floor space for cars. Also, it gives uniform ceiling heights—no flared heads or drop panels. You can leave the waffle ceilings exposed—without chipping, patching and grinding the concrete. That's because Steeldomes are removed with a patented device using compressed air, creating unblemished surfaces. Accurate concrete quantities are assured with Steeldome construction, because Steeldomes are rigid—there is no distortion when subjected to concrete weight at pouring time. Get these advantages for your next project. Ceco Steel Products Corporation. Sales offices, warehouses and fabricating plants in principal cities. General offices: 5601 West 26th Street, Chicago 50, Illinois.

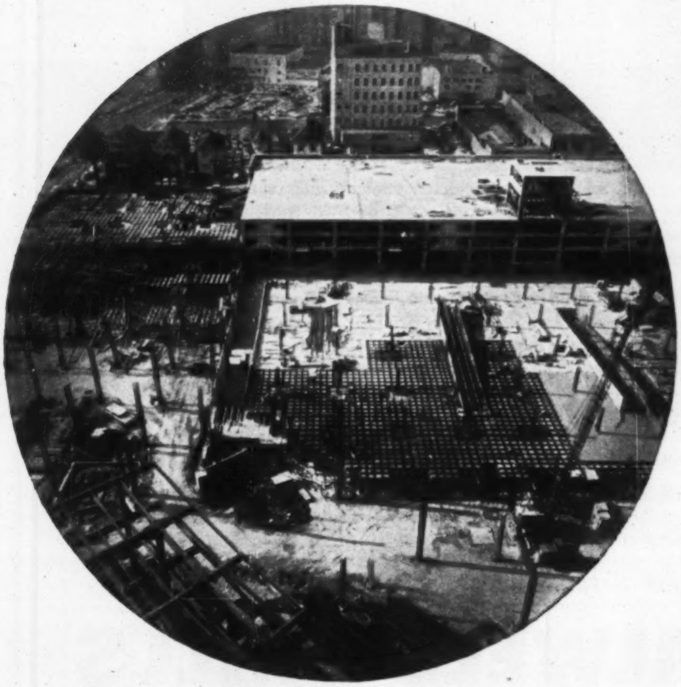
IN CONSTRUCTION PRODUCTS CECO ENGINEERING MAKES THE BIG DIFFERENCE...

Steelforms / Concrete Reinforcing / Steel Joists / Metal Roof Deck
Windows, Screens, Doors / Cecoframe Buildings / Metal Lath

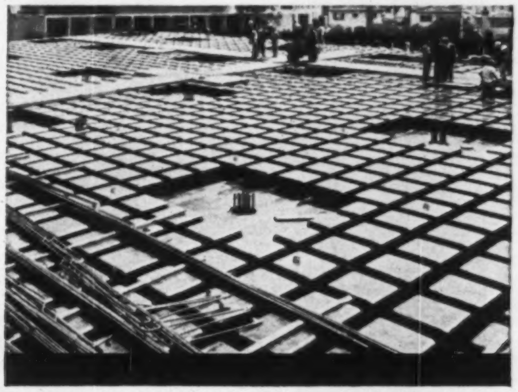
CECO STEEL



Site "Y" parking facility, Pittsburgh Parking Authority, Pittsburgh, Pa. Structural Engineer: Leland W. Cook. Contractor: Graziano Construction Co.



Kaiser Garage and Shops Building, Oakland, California. Architect: Welton Becket and Associates. Structural Engineer: Murray Erick Associates. Contractor: Robert E. McKee, Inc.



Ceco's one-piece Steeldomes in position, ready for reinforcing steel. Easily erected and removed, Steeldomes speed construction. There is no excessive clean-up expense because forms fit tight, leave no unsightly residue.

expansive? yes! expensive? no!

ENR

CECO STEEL PRODUCTS CORPORATION
5601 West 26th Street, Chicago 50, Illinois

Please send catalog No. 4007 covering Ceco Steeldome construction.

name____

position______________________________________

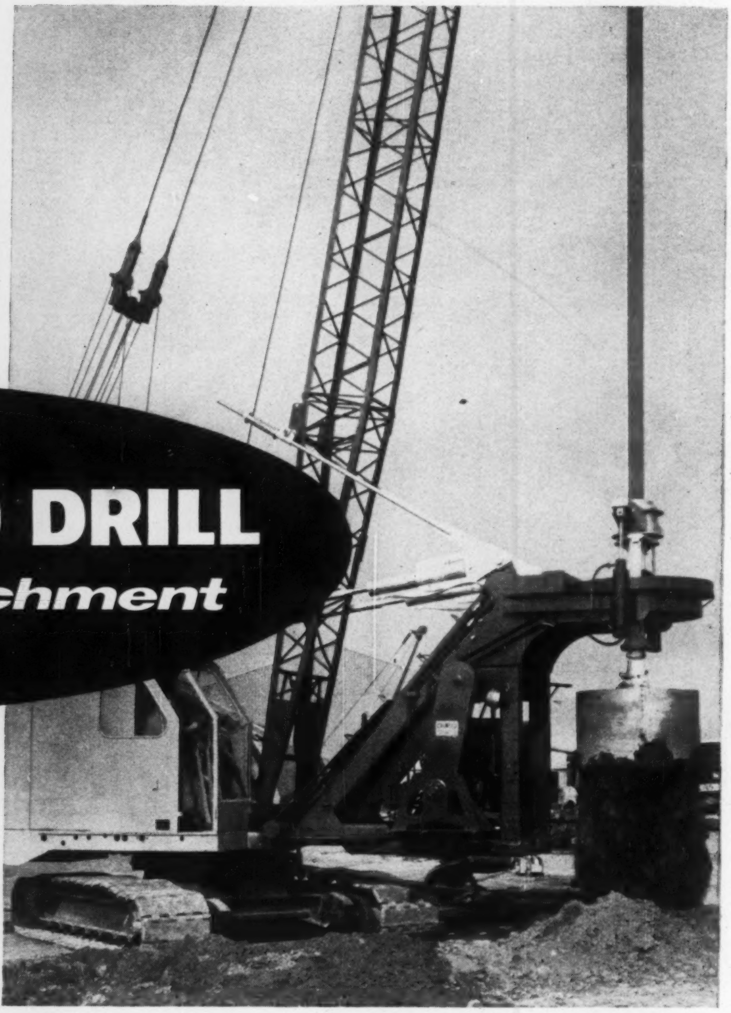
firm____

address______________________________________

city________________zone______state________

CIRCLE 181 ON READER SERVICE CARD

NOW... your crane can drill holes, too!



CALWELD DRILL

crane attachment

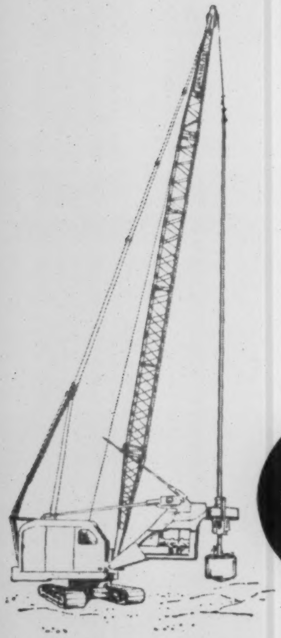
- **Mounts on any crawler or truck crane in 30 minutes.**
- **Digs holes 1′ to 10′ diameter and as deep as 200′.**
- **Drills up to 60′ per hour.**

Now, you can get all the Calweld big bore, fast drilling features and still use your crawler or truck-mounted crane for normal duty when needed. Because the new Calweld crane attachment is a completely self-contained unit, it can be mounted in 30 minutes on any standard ¾ ton crawler or 1 yd. truck mounted crane, ready to dig clean holes fast and straight without manual digging or extra finishing. Now available in three sizes . . . Model 150 B, 150 C, and 150 CH.

All models contain their own power units, and operate independently of the crane power to dig holes from 12″ to 120″ in diameter. Hydraulic controls are mounted in the crane cab for easy, one-man operation. The average crane man can operate a Calweld without previous training or experience.

Hydraulic drill positioner and boom stop combination also provide for slant hole drilling to a 1 to 3 batter with positive accuracy. Hydraulically-operated kelly drive yoke acts as kelly crowd and adds to the crane's capacity for pulling casings.

Telescoping and triplescoping kelly bar permit drilling to 150′ deep without extra drill stems. Drill buckets and attachments of various types are available for fast drilling under any conditions.



CALWELD

Write for literature today:

CALWELD DRILLS

Calweld, Inc. 7222 E. Slauson Avenue
Los Angeles 22, California

CIRCLE 182 ON READER SERVICE CARD

Men and Jobs

The Most Harassed Man in AASHO

State highway officials who now and then get caught up in political controversy and criticism can all be thankful they're not Michigan's John C. Mackie, the only elected state highway chief in the U. S.

He had to fight opposition to get his job; he's had to fight opposition in it. In four years of quarterbacking an ambitious $1.25-billion five-year plan for Michigan roads he's had to take all the blocks, tackles and occasional clips that come with big league political football.

But he seems to like it. Word is he'll run for reelection when his term ends early next year.

Mr. Mackie, a Democrat, has been fighting a running battle with a Republican controlled state legislature through his whole term—but with support of Gov. G. Mennen Williams.

Even as he took office he had nonpartisan opposition—from the Michigan Society of Professional Engineers. A Supreme Court case was instituted to determine whether he had the professional status the PE society said was required for his job. The newly elected commissioner, although graduated from Michigan State University in 1942 with a degree in civil engineering, had not been professionally registered.

MSPE asked the Supreme Court to mandamus the Attorney General, commanding him to remove Commissioner Mackie from office, but the judges decided against the society. "We get along with the society now," says the soft-spoken commissioner. "The difficulty just sort of died a natural death after the Supreme Court refused to act."

MICHIGAN'S ONE AND A QUARTER BILLION DOLLAR
FIVE YEAR HIGHWAY PROGRAM
JULY 1, 1957 — JULY 1, 1962

JOHN C. MACKIE, the only elected highway chief, is often on the carpet.

Having survived the Supreme Court test, the young commissioner promptly pulled what a member of his staff calls the "biggest political blunder of his career." He delegated authority to a subordinate to sign highway bonds that required his own signature. Official estimates say it cost the state $43,000 to issue new bonds.

Then his determination to switch the emphasis from rural roadbuilding to expressway construction led to the first legislative investigation of the department after he took office—and the high way department has been investigated every year since.

He announced that he would use the money from a $25-million bond issue, which his predecessor slated for the extension of Detroit's Northwestern highway, to convert the existing highway into limited access six-lane expressway.

The previous commissioner had also started to buy some right-of-way at Saint Charles in central Michigan for Route M-47. John Mackie quickly junked that program in the face of bitter criticism; it took a personnal appearance and a speech at Saint Charles, explaining the benefits of his proposed trunkline program, to pacify the aroused citizens. He was condemned in rural editorials, which claimed rural systems would be ignored by the new emphasis on arterial projects.

Next, Commissioner Mackie's controversial actions prompted a freshman state senator to demand an investigation of his right-of-way division for the purpose of exposing the alleged "waste of millions of dollars in irregular proceedings of right-of-way acquisitions."

In addition, Mackie was accused of maintaining a 34-man public relations staff in the department, and spending $585,000 a year to operate it. The course of the investigation over this one became so bitter that two senators almost came to blows on the chamber floor, one uttering a heated invitation to "step outside and settle matters."

"The first investigation was a shock," says Mr. Mackie, "but we are accepting them now as an occupational hazard. It's just part of a partisan political feud. Investigations take time that could be spent more profitably. That's about all . . . except for some hard feelings."

"If any of the attacks on the department . . . even approach the truth (and I don't believe they do) it is merely the result of our attempt to cut red tape. We are anxious to build rather than just talk."

John Mackie's program of upgrading 116 employees to reach maximum salaries in their civil service classifications developed into still another legislative uprising. The action was defended by the commissioner, who pointed out that the raises were granted to compete with private industry for specialists.

"Michigan has legislated the best constitutional civil service in the country," he said. "It has the strongest merit system of any state—that's why the highway department has such high quality personnel. I want to keep them, so I have to do my best to see that they are paid what they deserve."

When his five-year program was introduced in 1957, it was scoffed at by industry officials as unworkable and by politicians as a public relations gimmick, but editorial reaction was almost unanimously in favor of it, particularly since it included such projects as the long-wanted and much needed continuous non-stop highway from Detroit to Chicago. This 217-mile-long, $250-million freeway across southern Michigan will be among the longest stretches of toll-free Interstate mileage in the nation when it is completed in 1961. Construction began on its final section last June 7.

His five-year program called for improvements of over 2,900 miles of four-lane divided highway and paving all remaining 800 miles of gravel road on the state trunkline system. At the end of 1960, after the first 3½ years of the program, total four-lane divided mileage will be more than double the amount when he assumed office. Controlled access expressway mileage will total nearly 400 miles at the end of 1960, compared to little more than 100 in mid-1957.

Like many determined men, the young commissioner does not accept criticism graciously; he fights back.

When he decided to turn over highway survey work to department personnel rather than private consultants, and use his own forces more instead of consultants for highway designing, he was accused of "building the greatest political machine that Michigan has ever known," by Willis Hall, general manager of The Greater Detroit Board of Commerce. He published a scathing letter calling Mr. Hall's comments "peevish, sophomoric, tactless and discourteous."

Concerning the use of consultants, Mr. Mackie said, "When I became State Highway Commissioner in July 1957, the new highway construction program in the fiscal year ending June 30 totaled $162 million. The department had 3,490 employees. The new construction program in the fiscal year ending June 1959 totaled over $240 million and had 4,360 employees.

"To gear for the accelerated construction planned, an analysis of man-hours of design time required to meet the established construction schedule was made. It indicated we would reach peak design time in the last half of 1959 and the middle of 1960. Our staff includes 306 designers, draftsmen and trainees instead of the 450 required to do all our own work. The current level will be maintained and will meet most of our design needs in the forseeable future with the overloads going to consultants.

"The department currently has $360 million in construction under design, of which $73 million is out to 23 consultant firms; 20 are Michigan firms. This compares with $100 million in consultant design out to 12 firms in July of 1957.

"We pay consultants upwards of 3% for road design and 4% for bridge design. This does not include considerable time spent by our own coordinators who must be assigned to consultants to make decisions and expedite.

"Last year the department's own forces completed design on $94 million in road plans and $12.3 million in structure plans at a total cost of 1.95 percent of construction cost, including all costs; fringe benefits, rentals of office space, etc.

"On surveys we find the cost per mile averaging single and dual lane work was $2,015 for the 799 miles completed by our own forces during the past year and $3,570 per average mile for consultants employed in the past. Our costs include all costs. By eliminating surveys by consultants and increasing design work by our own forces, we have saved over $2 million.

"Our policy is to engage consultants to carry peak design loads and to perform other specialized work (aerial photogrammetry, movable bridges, special major structures) where we feel consultants have more experience and knowledge than is available within our own organization. Quite frankly, our specialists in structures, soils, construction materials and supvervision are generally better qualified than the working personnel of the architect-engineer firms who have been and are now performing design and drafting work for the Highway Department."

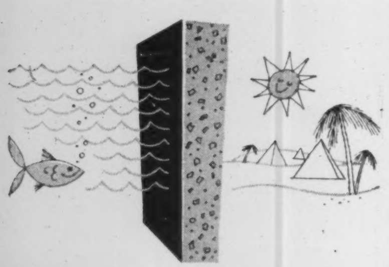
Fortunately for the otherwise harassed Mr. Mackie the Michigan State Highway Department has not been plagued with the financial difficul-

2 basic waterproofing needs

① reliable product

Men who write waterproofing specifications insist upon *proved* products which they know will uphold their reputations. When they specify IRONITE® WATERPROOFING, a metallic water resistant compound, they know that:

- IRONITE WATERPROOFING is not merely an outer coating
- Its fine particles are carried in suspension in water and thus actually work their way into any and all voids or cavities in the concrete, brick or other porous surfaces
- These particles then oxidize and expand to become a part of the mass to which the IRONITE WATERPROOFING is applied
- Cannot scale, blister, crack or peel
- IRONITE WATERPROOFING cannot be removed without the destruction of the underlying surface
- It has proved its ability to stand up indefinitely in some of the world's most famous buildings



② reliable application

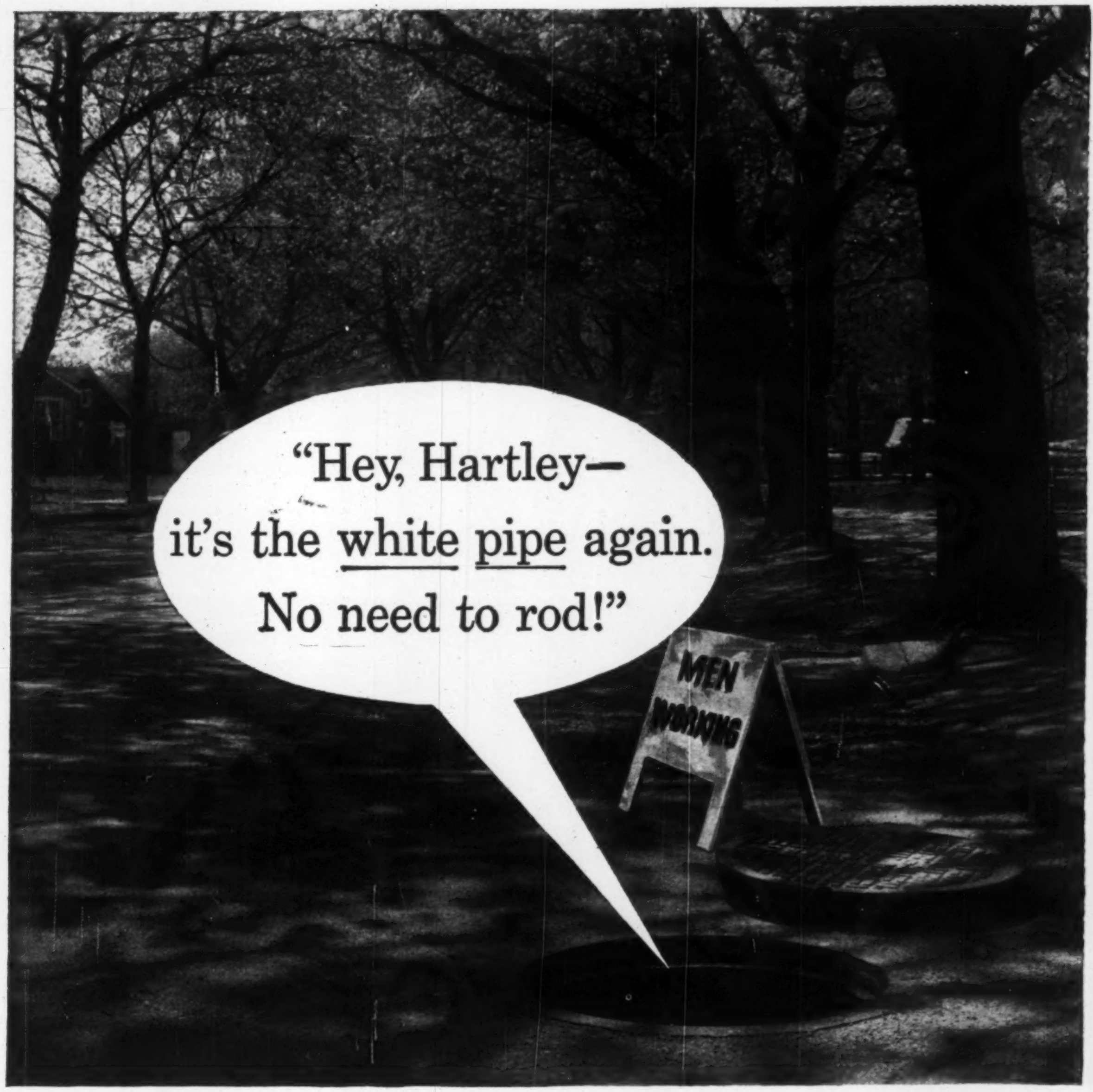
Experienced specifiers know that SKILLED APPLICATION is just as important as product competence!

IRONITE WATERPROOFING has been outstandingly successful in all types of industrial, commercial and institutional buildings for more than 50 years because it is applied *by licensed contractors & engineers* who are specialists in the solution of all types of waterproofing problems.

Send for details and information regarding the location of your nearest IRONITE licensee. Write IRONITE COMPANY, Suite 729—208 South LaSalle St., Chicago 4, Ill.

IRONITE COMPANY

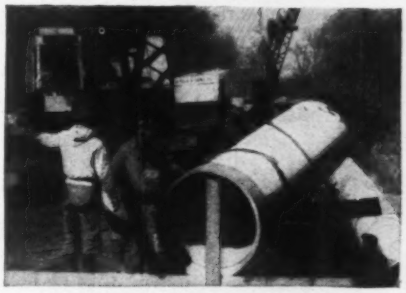
® Registered Trademark


"Hey, Hartley—
it's the white pipe again.
No need to rod!"
MEN WORKING

Right! There's no rodding necessary because roots just can't get in and clog up Transite®, *the white sewer pipe.* Johns-Manville's patented Ring-Tite® Joint keeps out even the thirstiest of these system disrupters. And it remains impenetrable for the duration of the line. Remember, by keeping roots out you eliminate the major cause of expensive periodic cleanouts . . . an expense which can run over $2,000 annually per mile of pipe in a system having joints that are not tight.

Actually, Transite starts saving you money from the very beginning. Its long length and light weight make this asbestos-cement pipe easy to handle in trucking, moving and lowering into the trench. Once in the trench, Transite adjusts easily and speedily to accurate line and grade. And that Ring-Tite coupling makes a dependable joint quickly and effortlessly. You'll save on operation costs too, because Transite's low coefficient of friction (n = 0.010) means faster flow and shallower trenches.

Hartley knows what he's talking about when he says that Transite can cut *your* sewer system costs. Get all the details on Transite, the white sewer pipe. Write Johns-Manville, Box 14, EN-2, New York 16, New York. In Canada: Port Credit, Ontario.

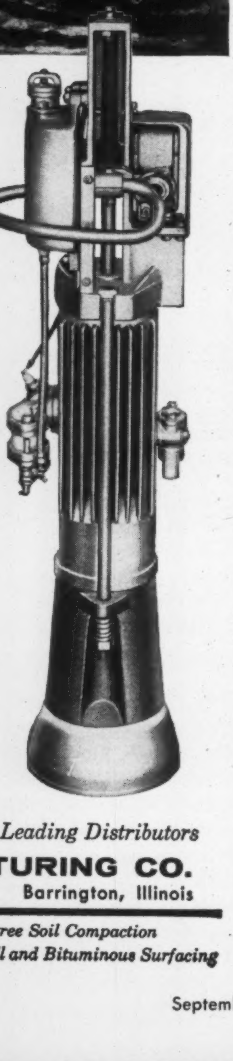


JOHNS-MANVILLE
TRANSITE PIPE

JM

Where SPECIFICATIONS call for . . . . .

HIGH DEGREE SOIL COMPACTION



BARCO RAMMERS are THE ANSWER!

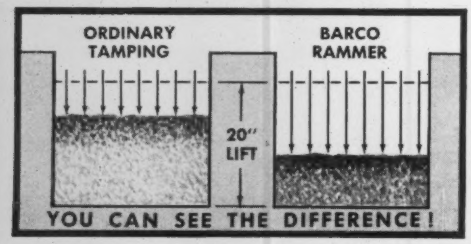
YOU can't get *high degree* SOIL COMPACTION by "patting it" or "shaking it." For deep, penetrating force to produce 95%, 97.5%, or even 100% compaction, Barco Rammers are THE ANSWER. For many soil conditions, they are the only answer.

High degree soil compaction is worth every cent it costs. Barco Rammers are especially effective for compacting fill in restricted areas—close to walls, culverts, abutments, around footings, and in trenches.

ONE MAN OPERATION—On area tamping, one man can average 20 to 30 cubic yards of fill per hour. On 18" trench backfill, using lifts up to 24", the rate is 360 to 600 feet per hour.

ASK FOR A DEMONSTRATION—We will be glad to arrange a demonstration for you; see our nearest distributor or write.

SEND FOR A COPY OF CATALOG 621.



Sold and Serviced by the Nation's Leading Distributors

BARCO MANUFACTURING CO.
514K Hough Street • Barrington, Illinois

PRODUCTS BACKED BY EXPERIENCE BARCO FOUNDED 1906

BARCO RAMMER *for High Degree Soil Compaction*
BARCO-VIBRA TAMP *for Granular Fill and Bituminous Surfacing*

ties that the state's antiquated constitution has forced on other functions of the government. Early in the 1950s the state legislature authorized the highway commissioner to borrow money through the issuance of bonds to be retired from future highway revenues, without the prior approval of the legislature. The Michigan constitution requires all gas and weight tax revenues to be used for highway purposes and not diverted for other governmental costs.

At one point during his term the legislature attempted to raid the state highway funds and divert money collected from gasoline taxes to other purposes not directly connected with highway construction. In the 1957 session an attempt was made to use state highway money to pay state police for highway traffic enforcement, and to use money from gasoline taxes—all committed to the highway department by law—to pay utilities to move their property from the old highway right-of-way to the new. The attempts were unsuccessful.

Commissioner Mackie is quick to praise Michigan's highway constractors for their efforts in keeping his five-year construction program on schedule. Considering, he says, that there are only about 154 days between freezing temperatures, and 47 of these are Saturday, Sunday and holidays, and rain will fall on 53 days, "the citizens of Michigan owe the highway contractors of this state a debt of gratitude for their outstanding contribution in our efforts to modernize our highway system." The plan is on schedule, and in some areas it is ahead of schedule.

The young Mackie took a smattering of business, military and political experience into the office of highway commissioner.

He was born in Toronto and brought to Michigan four years later. Still tall and athletic—he tries to play handball every day—he participated in sports at Michigan State.

After College, he joined Warner Aircraft in Detroit. World War II led him to an enlistment in the Army Air Corps where he was commissioned a lieutenant. Denied flight school because of a slight eye defect, he was sent to the Pacific as operations officer for bombers hedge-hopping the Pacific islands toward Japan.

He worked as a consulting engineer in Detroit for a short time after his separation from service, and in 1952 formed the Flint Surveying and Engineering Company, which held consulting engineering contracts with General Motors Corp. during construction of the Chevrolet engine plant and stamp-

You can span nearly everything at LESS COST with

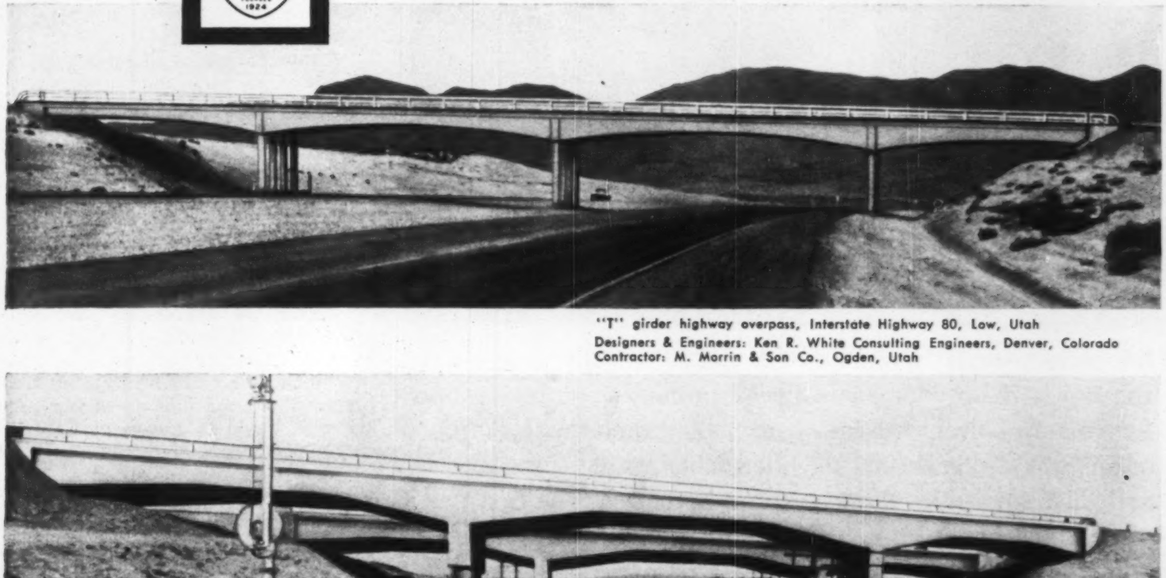
REINFORCED CONCRETE

Spanning a river . . . a highway . . . a railroad . . . or other hazards? You can do it more economically with reinforced concrete. Only reinforced concrete offers the cost-saving advantages of unlimited design and construction flexibility for terrain and usage . . . minimum construction time through ready availability of materials and labor . . . lowest structural maintenance. It's more durable, too. Reinforced concrete combines reinforcing steel with concrete to provide the most rugged structure possible.

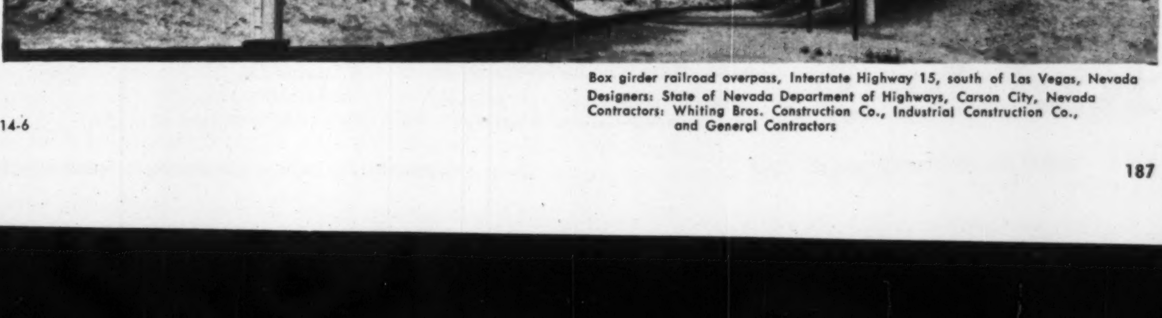
Concrete Reinforcing Steel Institute
38 South Dearborn Street
Chicago 3, Illinois

CONCRETE
REINFORCING
STEEL INSTITUTE
C.R.S.I.
FOUNDED
1924

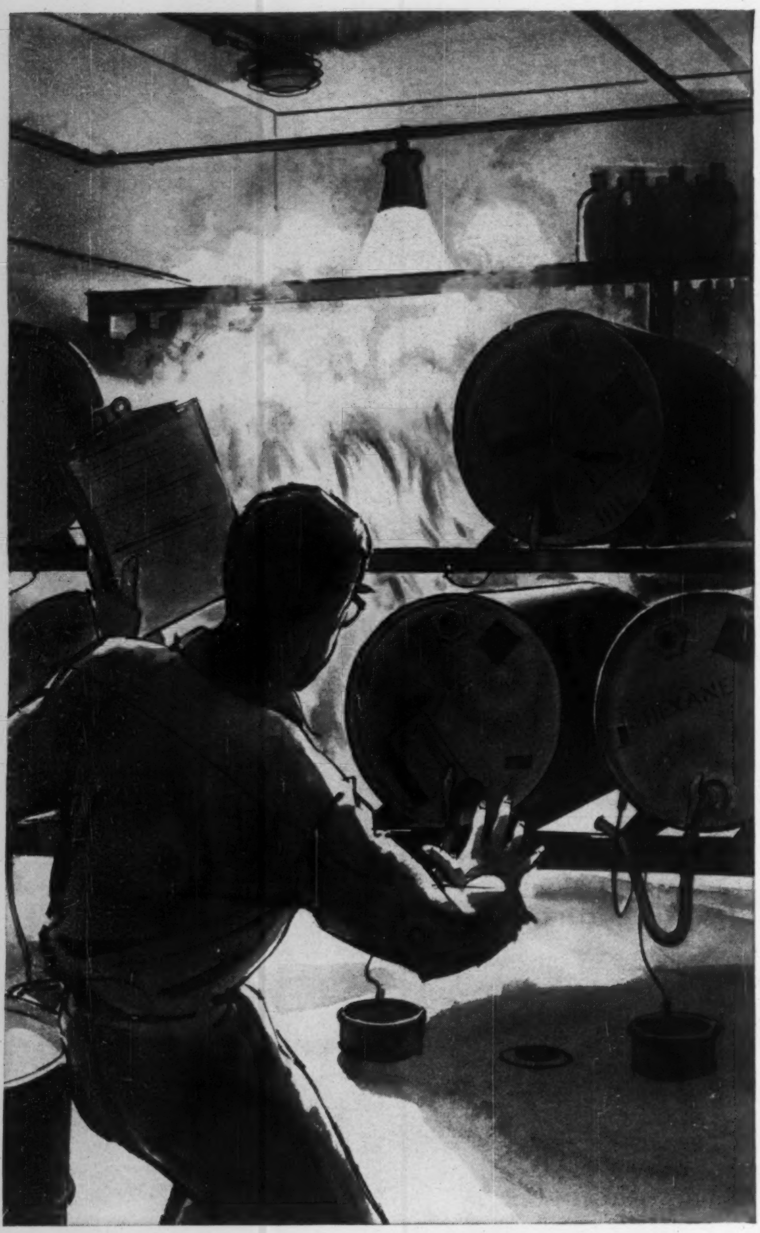
Arch bridge over north fork of Payette River, State Highway 15, Smiths Ferry, Idaho
Designers: Idaho Department of Highways, Boise, Idaho
Contractor: C. F. Dinsmore



"T" girder highway overpass, Interstate Highway 80, Low, Utah
Designers & Engineers: Ken R. White Consulting Engineers, Denver, Colorado
Contractor: M. Morrin & Son Co., Ogden, Utah



Box girder railroad overpass, Interstate Highway 15, south of Las Vegas, Nevada
Designers: State of Nevada Department of Highways, Carson City, Nevada
Contractors: Whiting Bros. Construction Co., Industrial Construction Co., and General Contractors



Knockout punch! In seconds, fire can have your business on the ropes. Keep your guard up by protecting storage rooms for volatile solvents, gases, flammable liquids with a *fully-automatic* Kidde carbon dioxide extinguishing system. U.L. and F.M.-approved Kidde systems actuate at the first flash of fire, smother it in seconds, leave no mess, turn off power and sound an alarm. Kidde's 35 years' experience can help you protect *any* hazard. Write today and find out how.

Kidde

Industrial and Marine Division
Walter Kidde & Company, Inc.
944A Main St., Belleville 9, N. J.
Walter Kidde & Company of Canada Ltd.
Montreal—Toronto—Vancouver

ing plant in Flint and the Grand Blanc Tank Arsenal. He served three two-year terms as Genesee County surveyor at the same time.

He was the youngest man ever to be Michigan's highway commissioner when elected at the age of 37. Michigan, incidentally, has elected its highway chief since 1913.

Briefs . . .

Business

Allen Latham, Jr., has been promoted to senior vice president of Arthur D. Little, Inc., international industrial research company with headquarters in Cambridge, Mass. He will remain in charge of the company's engineering division.

Dalton Dalton Associates, architects and engineers in Cleveland, have appointed **Eugene B. Fisher, Jr.,** as director of hospital planning and **Don M. Hisaka** as director of architectural design.

Robert W. Thornburg has been named manager of the engineering department of Blaw-Knox Company's construction equipment division. His office will be in Mattoon, Ill.

David H. Griffin has been elected president of the Griffin Corporations, comprising Griffin Equipment Corp. and Griffin Wellpoint Corp., both of New York City. He is succeeding the late Hugh J. Hush.

Arthur Fertell has been elected vice president of Raymond International, Inc., New York City. He has served continuously as a supervisor of heavy construction work since he joined the company in 1922.

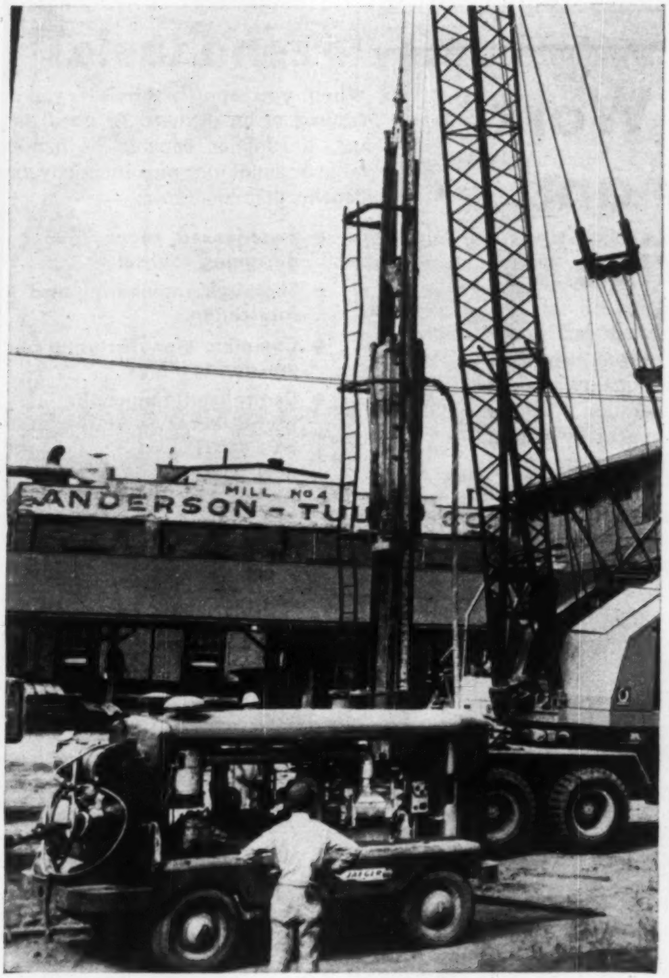
Ray K. Chalfont, Jr., has opened a consulting engineering office in Atlanta, Ga.

Associations

Frederick J. Woodbridge, partner in Adams & Woodbridge, heads the new slate of officers of the New York Chapter of the American Institute of Architects. Following him up as vice president is **David L. Eggers** of Eggers & Higgins. **Peter S. Van Bloem** of Voorhees, Walker, Smith, Smith & Haines is secretary and **Michael M. Harris** of Harrison & Abramovitz is treasurer.

Jerome J. Madigan has been selected executive vice president of the Home Manufacturers Association. He is now director of the Field Service Division.

Ross H. Walker, of Richmond, Va., has taken office as chairman of the Ohio River Valley Water Sanitation Commission. He has been the Virginia commissioner on the interstate agency since its inception in 1948.



STEADY PRESSURE for McKiernan-Terry 9B-3 Hammer with Jaeger "600".

MORE AND MORE CONTRACTORS ARE FINDING OUT . . .

AIR COSTS LESS WITH A JAEGER ROTARY

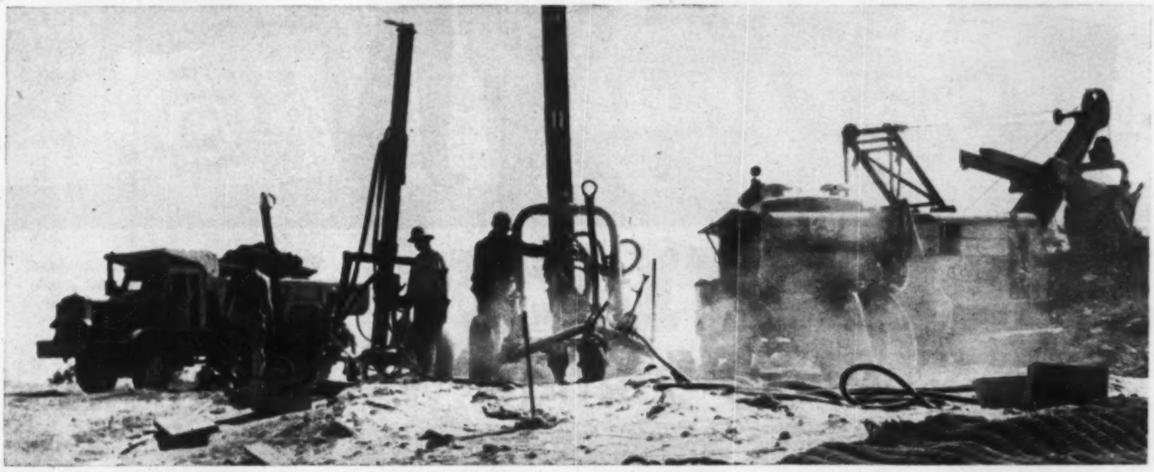
Why do you suppose the men who use Jaeger "600" compressors behind big pile hammers say the Jaeger *"is as smooth as steam"?* Air demand fluctuates violently when you operate a big McKiernan-Terry or Vulcan driver. Jaeger automatic control of engine and compressor is so smooth, so closely regulated, *so instant acting,* that air pressure is held constant under all normal operating conditions. Keeps the tools operating at top efficiency, without over-run, engine racing, wasteful use of fuel.

PAYS OFF ON DRILLING, TOO

The Jaeger "600" also *proves* its greater efficiency by producing full rated capacity at 100 rpm slower speed than others—1700 rpm instead of 1800 rpm — *using the same GM Diesel 6-71 engine.* You save fuel, save engine and compressor wear every hour you work. More than 500 cf of air per pound of fuel, and often as many as 8,000 hours without a vane replacement, are the proof.

Ask your Jaeger distributor for the cost-saving figures on any size Jaeger Rotary — 75 to 900 cfm, or send for new Catalog JC-0.

BELOW: **DRILLING SHOT HOLES AHEAD OF BACKHOE** on 10½ mile trenching job for big Eastern steel company's research center. Two Jaeger "600" compressors supplied low-cost air.



THE JAEGER MACHINE CO., 200 Dublin Ave., Columbus 16, Ohio
Jaeger Machine Company of Canada, Ltd., St. Thomas, Ontario.
Worldwide sales and service through Jaeger International Corp., Apartado 137, Panama, R. P.

PUMPS • CONCRETE MIXERS • TRUCK MIXERS • CONCRETE SPREADERS • FINISHERS • FINISHER-FLOATS

Catalogs you should have for your ready reference if you want Aluminum or Steel Windows or Curtain-Walls — or Detention Window Systems — that

Back Up Your Work With Quality and Better Service

Windows and Curtain-Walls are an important and major integral part of a building structure. Therefore, it pays in ultimate overall savings to specify the best quality product the market affords — especially in consideration of initial cost and minimum maintenance. What you actually gain in the long run results from much more than the mere physical product itself. A sub-contractor's years of experience, know-how and proven policy of client-responsibilities all account for much of the true value.

When you specify Bayley, you are assured of an intrinsically good product, a supplier capable of handling large or small jobs ***plus*** the many extra benefits that come from —

- **Experienced, cooperative designing counsel**
- **Thorough engineering and fabrication**
- **Complete manufacturing and erection facilities**
- **Centralized, financially sound responsibility**
- **Proven record for dependable follow-through**
- **Capabilities that are backed up by Bayley's 80 years of reliable service to the construction industry**

1960
BAYLEY
CURTAIN WALL SYSTEMS
DETENTION WINDOW SYSTEMS
BAYLEY
STEEL WINDOWS AND DOORS
1960
BAYLEY
ALUMINUM WINDOWS

BAYLEY

WRITE or ask the Bayley Representative or District Sales Office nearest you for copies of these catalogs or for counsel on your current projects.

WINDOW and CURTAIN-WALL SYSTEMS

The WILLIAM BAYLEY Co.
Springfield, Ohio
Agents in All Principal Cities

SPRINGFIELD, OHIO
1200 WARDER ST.
FAirfax 5-7301

District Sales Offices:

NEW YORK 16, N. Y.
280 MADISON AVE.
MUrray Hill 5-6180

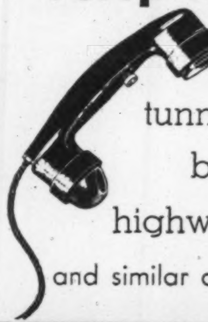
CHICAGO 2, ILL.
105 W. MADISON ST.
RAndolph 6-5997

WASHINGTON 5, D. C.
1426 "G" ST., N.W.
STerling 3-3175

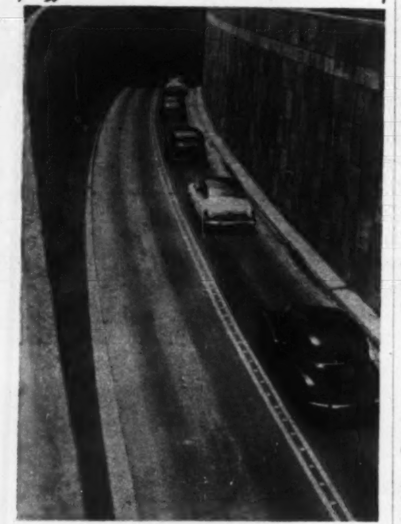
ORIGINATORS • DESIGNERS • MANUFACTURERS • INSTALLERS

CIRCLE 190 ON READER SERVICE CARD

Sound Powered Telephones



for
tunnels
bridges
highways
and similar arteries



Help to keep traffic rolling . . . to ease tie-ups . . . to report changing conditions.

NEED NO CURRENT

These phones provide positive communication at all times without the use of batteries or other outside sources of current. Operate with unusual clarity over a distance of many miles. In outdoor or indoor models—in standard systems or those altered to your specifications.

Send for illustrated catalog

HOSE-McCANN
TELEPHONE CO., INC.
761 THIRD AVE. BROOKLYN 32, N. Y.

CIRCLE 34 ON READER SERVICE CARD

Books

Concrete Chimneys

Reinforced Concrete Chimneys—Second Edition, by C. Percy Taylor and Leslie Turner. 85 pages. Concrete Publications Ltd. London. $2.80.

As a second edition of a book originally published in 1940, this volume contains one new chapter and several important revisions.

The new chapter deals with the deflection and sway of tall chimneys under wind loading. The effects of steady pressure and the oscillation resulting from wind eddies are discussed. Formulas for vibration frequency and natural frequency of the shaft are included.

A simpler method of analyzing annular sections subjected to bending and axial load replaces the more complex method of the earlier edition. The basic data on thermal stresses in Chapter V is applicable to the design of concrete tanks and biological shields in atomic power plants.

Data on Materials

1960 Building Products Register—By the American Institute of Architects, 1735 New York Ave., N. W., Washington 6, D. C. $25.

This handbook lists about 1,300 building products and their main properties. The AIA sponsored it to promote better use of materials through knowledge of their significant characteristics.

The products are grouped in categories and subcategories. Data given on each generally includes manufacturer's name and address, catalogs available, standard specifications governing, recommended uses, dimensions, physical and chemical properties, inspection and other information pertinent to the specific type of product.

The information is given in very brief form, extensive use being made of abbreviations. Until the user becomes familiar with these, the book may prove difficult. The format most likely will be improved in subsequent editions as dictated by experience with it.

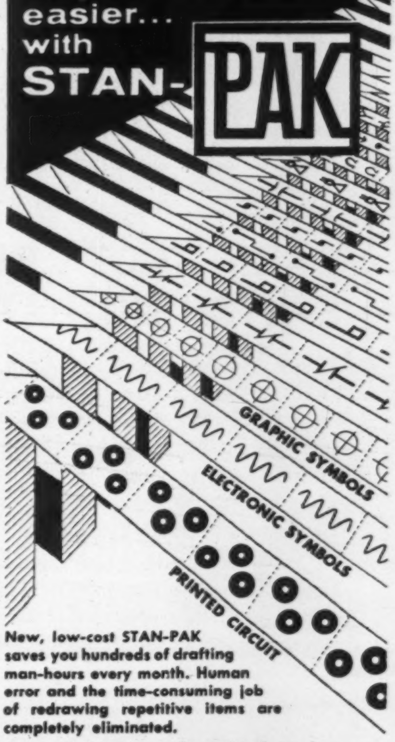
Nuclear Science

Basic Principles of Nuclear Science and Reactors—By Alan M. Jacobs, Donald E. Kline, and Forrest J. Remick, 254 pages. D. Van Nostrand Co., Princeton, N. J. $6.50.

Here is a book designed to bridge the gap between those texts presenting rigorous mathematical derivations of

(*Books continued p. 194.*)

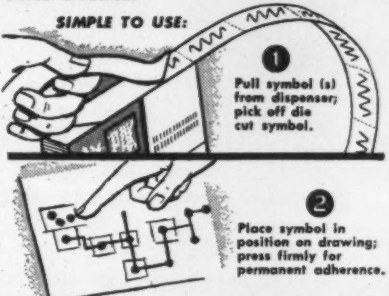
NOW... YOUR OWN REPETITIVE SYMBOLS
dispensed faster, easier... with
STAN-PAK



New, low-cost STAN-PAK saves you hundreds of drafting man-hours every month. Human error and the time-consuming job of redrawing repetitive items are completely eliminated.

***Any* symbol that is used repetitively can be custom made for you and pre-printed on convenient STAN-PAK rolls. Currently, these handy rolls are finding wide use for printed circuit, electronic and graphic symbol applications. Excellent dimensional stability is maintained. ALL STAN-PAK rolls are made of strong tri-acetate and are adhesive backed.**

SIMPLE TO USE:



① Pull symbol (s) from dispenser; pick off die cut symbol.

② Place symbol in position on drawing; press firmly for permanent adherence.

See for yourself. Mail the coupon today!

STANPAT PRODUCTS, INC.
Whitestone 57, N. Y.

STANPAT PRODUCTS, INC.
Whitestone 57, N. Y.
Phone: Flushing 9-1693-1611
☐ Send me more information and free STAN-PAK sample. Dept. 21
Name__________
Company__________
Address__________
City__________ State__________

CIRCLE 191 ON READER SERVICE CARD

More proof that...

AMSCO HELPS YOU MOVE MORE TONS PER DOLLAR

How a large contractor and a crusher manufacturer have cut downtime and increased service life with AMSCO equipment

DAILY "TOOTH REPAIR" ELIMINATED BY SWITCHING TO AMSCO 2-PART TEETH

Mount Vernon Contracting Corp. is a large general contractor doing work throughout the middle Atlantic states. Its present contract is for road construction on the Cross Westchester Expressway, linking the New York State and New England Thruways.

The firm's four power shovels and two backhoes on this job are equipped with Amsco dippers or dipper parts and Amsco Simplex* 2-Part Teeth. Reason: competitive teeth previously used required daily welding build-up to maintain their points. Now, since switching to the Amsco Simplex, teeth are changed only about once a week. And change-over is *only a 5-minute job!*

With shovels operating 8 hours a day, 5 days a week, this is a mighty important advantage for Mt. Vernon. No wonder they say—"These Simplex teeth really stand up in service, especially in rock, and save us a lot of downtime."

*Patent No. 2,904,908

AT MT. VERNON CONTRACTING CORP.

AMSCO CRUSHER ROLLS HANDLE 50,000 YDS. BETWEEN BUILD-UPS

Carroll Hicken (left) owner of Highway Machinery Company, Waukesha, Wisconsin, is a long-time user of Amsco equipment. His firm designs and manufactures self-propelled machines for crushing road material, both gravel and stone. All of their machines are rented out or sold to contractors, with maintenance and service handled by Highway Machinery.

For years, the company has used Amsco Manganese Steel Crusher Rolls exclusively. Amsco Manganese welding rods and bars are also used for build-up. On a typical rental machine, pictured at right, the Amsco rolls had *crushed over 50,000 yds. since their last build-up* six months before.

Mr. Hicken says that with Amsco Manganese rods he can multiply the life of a roll by 5 to 10 times. He adds—"They have proven very fine, and we're getting more yardage than with any rods we formerly used."

AT HIGHWAY MACHINERY COMPANY

AMSCO

AMERICAN Brake Shoe COMPANY

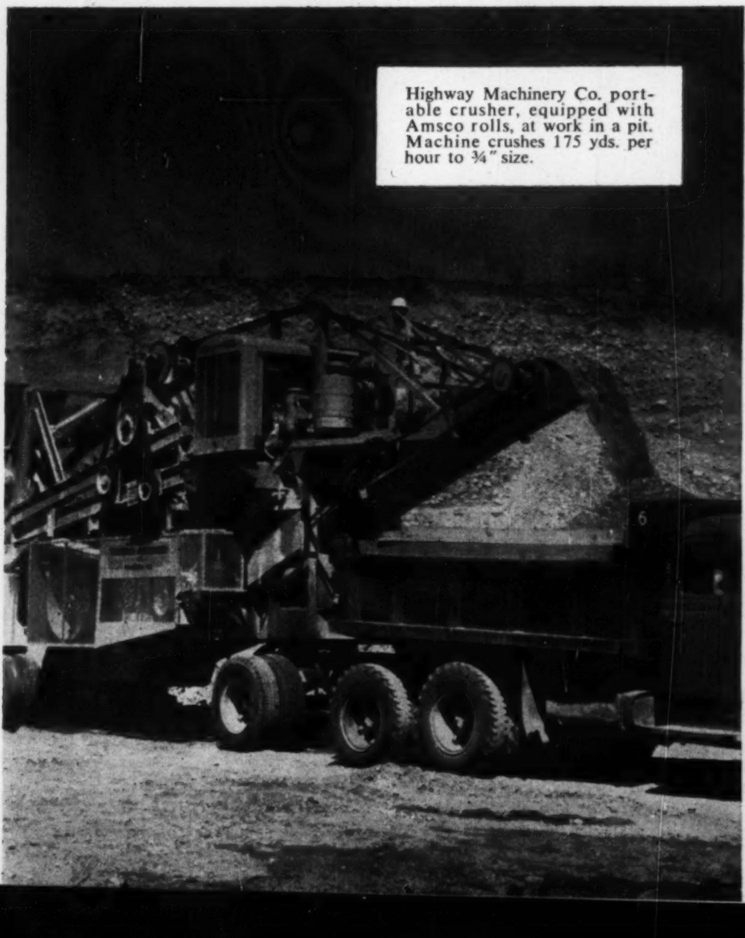
American Manganese Steel Division • Chicago Heights, Ill.

Other plants in: Denver • Los Angeles • New Castle, Dela. • Oakland, California • St. Louis
In Canada: Joliette Steel and Manitoba Steel Foundry Divisions
Welding products distributed by Canadian Liquid Air Co., Ltd.

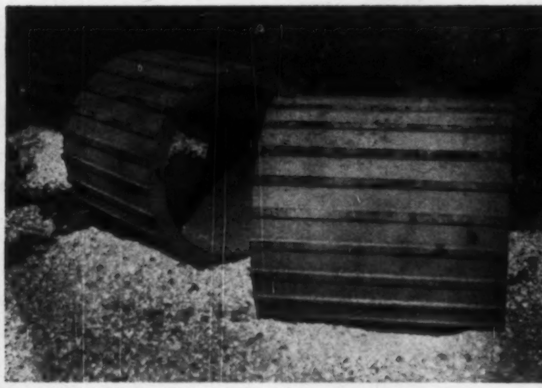
CIRCLE 192 ON READER SERVICE CARD

◀ Northwest shovel, equipped with Amsco Dipper and Simplex 2-Part Teeth, at work on Cross Westchester Expressway project.

Shovel operator, Walter Reich, inspecting Amsco Simplex 2-Part Teeth used on Mt. Vernon Contracting Corp. shovel. ▶



Highway Machinery Co. portable crusher, equipped with Amsco rolls, at work in a pit. Machine crushes 175 yds. per hour to ¾" size.



Amsco 25 x 24 manganese steel crusher rolls, of type used in portable crusher at left.

Welder demonstrating how Amsco Manganese rods are used for build-up on rolls.

How to square a circle with Gates

PROJECT:

$60 million Los Angeles International Airport expansion program.

Both the underground Central Utilities Vault and the circular foundation of the new Terminal Building were formed with Gates Vertical Rod System *using the same form panels!* (Without additional modifications, backing or templates.)

1. Vault roof and 16-foot walls poured monolithically.
2. Forms stripped and panels moved to Terminal Building site.
3. Circular foundation, 16 feet high, diameter of approximately 130 feet, formed to precise curvature using the same ¾" Gates thinpanels.
4. Outside forms "floated" with inside bracing only. Gates PlastiCone* breakback form ties provided 1-inch breakback specified.

Gates built-in versatility is designed to square circles...cut costs... help you bid a job closer without risking pocketbook or reputation! Get the whole story on Gates Concrete Forming Systems and techniques.

*TRADEMARK

USE GATES IT'S GALVANIZED

Gates & Sons, Inc.

THERE'S A GATES SYSTEM FOR EVERY FORMING NEED

80 South Galapago Street—Denver 23, Colorado

Branches in Spokane, Rochester, Calgary

Representatives in principal North American cities

CONSULT OUR CATALOG IN SWEET'S 1960 ARCHITECTURAL & LIGHT CONSTRUCTION FILES...OR WRITE FOR COMPLETE INFORMATION

nuclear theory and those presenting practical descriptions of industrial applications. The authors have limited the mathematics in this volume to simple calculus.

The first three chapters serve as introduction to nuclear theory, concentrating on subjects like binding energy, radioactivity and compound nucleus theory. The next two chapters go on to discuss the fission process and chain reactions. Roughly half the book is devoted to reactors, with emphasis on comparisons of the different types.

One chapter discusses the problems of health hazards and shielding, and the final chapter takes up the industrial, medical and agricultural uses of radiation. This includes a rather long section on radioisotopes used as tracers to study photosynthesis, lubrication and other biological and mechanical processes.

Stress-Strain Analysis

MECHANICS OF MATERIALS—By Archie Higdon, Edward H. Ohlsen and William B. Stiles. 502 pages. John Wiley & Sons, Inc., New York, N. Y. $7.75.

This well-illustrated text covers the usual ground in strength-of-materials books—analysis of principal stresses, flexure and column formulas, double-integration and area-moment methods for calculating deflections, etc.

It also includes much material of value to mechanical engineers. A long chapter on torsion contains stress analyses of helical springs and circular tubes. Other chapters discuss fatigue failures—and dynamic loading.

Another feature, which brings the book up to date for structural engineers, is its treatment of plastic theory and plastic analysis of indeterminate structures.

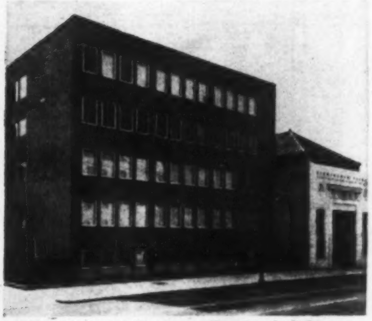
Welded Highway Bridges

WELDED INTERSTATE HIGHWAY BRIDGES—edited by James G. Clark, 269 pages, Lincoln Arc Welding Foundation, Cleveland, Ohio. $2.00.

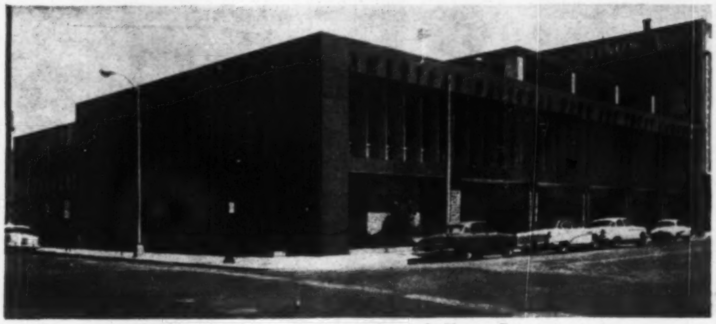
Fourteen award-winning welded steel bridge designs are illustrated and discussed. Detailed drawings are included. Designs are intended for use on the Interstate System.

Design types reviewed include continuous, simple and cantilever plate girders; two-hinge and three-hinge arches; conventional and orthotropic plate box girders; and double-leaf bascule.

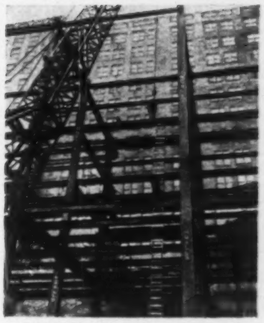
(*Books continued p. 196.*)



The Federal Reserve Bank of Atlanta
Birmingham Branch office



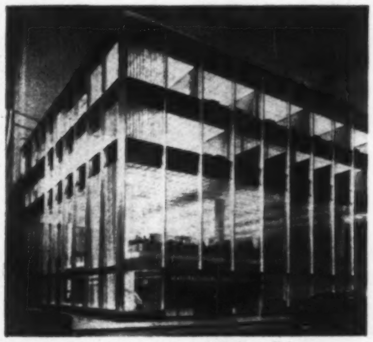
The American National Bank & Trust Co.
New head office, Mobile, Alabama



Whitney National Bank
Extension, New Orleans

Why Banks put their Money in Structural Steel

. . . fabricated and erected by Ingalls



Manufacturers Trust Co.
Fifth Avenue office, New York

When you design with steel, you make a sound investment. Economy, strength, and security are your dividends . . . year after year after year. And when you specify Ingalls to fabricate the structural steel, you can bank on skill and experience in building that investment. Plan with steel—Ingalls fabricated steel —on your next job.

The First National Bank of Atlanta
Peachtree and North Ave., Atlanta

INGALLS

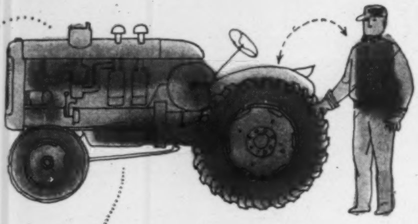
THE INGALLS IRON WORKS COMPANY
Executive Offices: Birmingham, Alabama

CIRCLE 195 ON READER SERVICE CARD

LOOK AT YOUR SAVINGS WHEN YOU DRIVE A SCHRAMM PNEUMATRACTOR (Self-propelled Compressor / Tractor)

❶ you get

this 125 cfm compressor ......



on a husky unit that doubles as a tractor ......

one man does the work... and drives!

❷ you drive

compressed air anywhere fast

and you drive it along with any job!

❸ you stop

towing (no more trucks, crews tied up)

pushing (and the cost each time they push)

lost time (while men wait for compressor)

YET YOU PAY LESS for a hard-working 2-in-1 Schramm 125 cfm Pneumatractor than for most anyone else's portable compressor alone!

Cost competitive diesel portable 125 . . $5,945
Cost Schramm Diesel Pneumatractor . . $5,725
Savings . . $ 220

Write for Catalog 5945. And see your nearest Schramm Dealer listed in the Yellow Pages.

Schramm PNEUMATRACTORS
Self-propelled Air Compressors
620 North Garfield Ave., West Chester, Pa.

Schramm, Inc., manufacturers of Rotadrills (Pneumatractor Mounted, Truck Mounted, Crawler Mounted), Air Compressors (Portable, Stationary), Self-propelled Air Compressors (Pneumatractors) and Booster Compressors

Just Published . . .

The Design Potential of Metal Curtain Walls—Publication 788. Building Research Institute, 2101 Constitution Ave., N.W., Washington 25, D. C. $5.00.

The Current Status of Modular Coordination—Publication 782. Building Research Institute, 2101 Constitution Ave., N.W., Washington 25, D. C. $2.50.

Recent Yields of Wood Research Laboratory of Virginia Engineering Experiment Station—by E. George Stern. Virginia Polytechnic Institute, Blacksburg, Va.

The Cost of a Schoolhouse—Educational Facilities Laboratories, 477 Madison Ave., New York 22, N. Y.

Selected Materials on Radiation Protection Criteria and Standards: Their Basis and Use—U. S. Government Printing Office, Washington, D. C.

Progress Reports of Investigation of Railroad Rails—by Ralph E. Cramer. University of Illinois Engineering Experiment Station, Urbana, Ill. 50¢.

A Comparison of the Performance of Various Room Heating Units Used in the I-B-R Research Home—Circular No. 68. University of Illinois Engineering Experiment Station, Urbana, Ill. 50¢.

Part II: Economic Potential and Development Program as of 1959—TID-8517. Superintendent of Documents, U. S. Government Printing Office, Washington, D. C. 70¢.

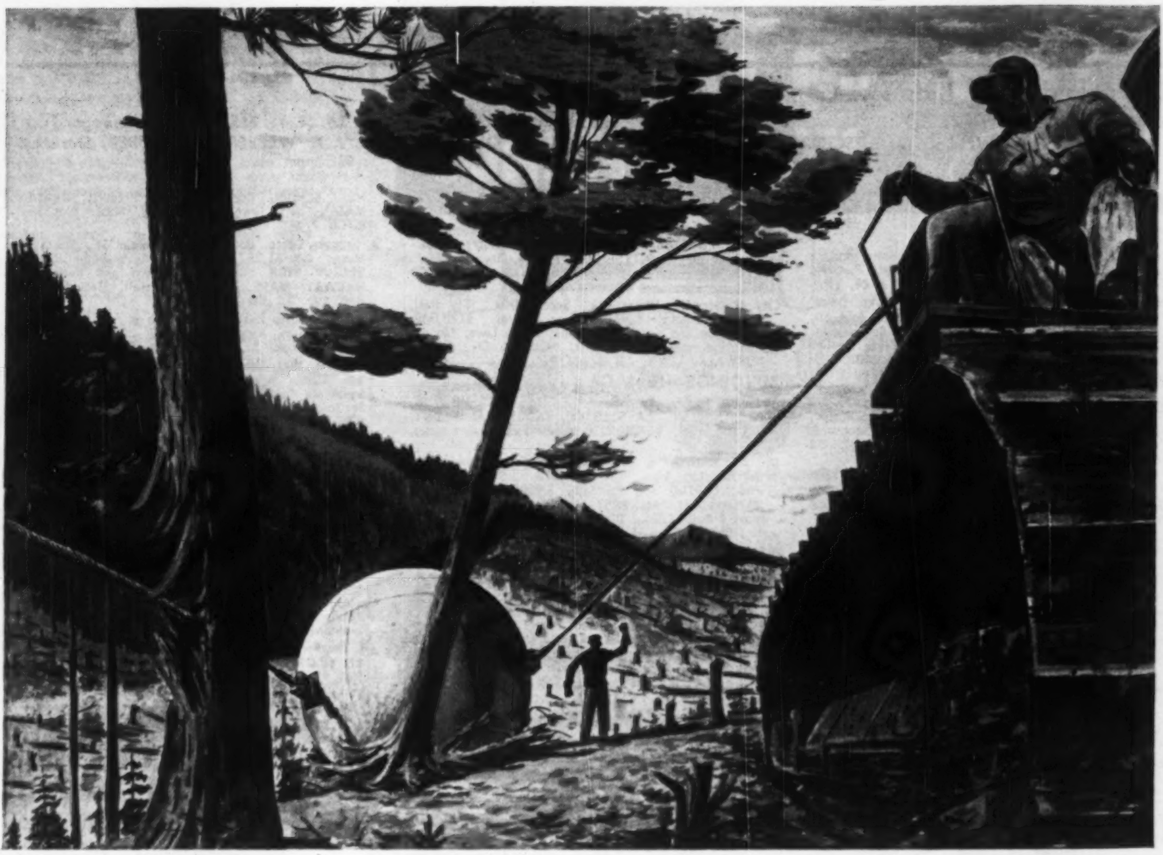
Multiple-Purpose River Basin Development—United Nations Flood Control Series No. 10. International Documents Service, Columbia University Press, 2960 Broadway, New York 27, N. Y. $2.00.

Engineering Mathematics—by J. Blakey and M. Hutton, 603 pages. Philosophical Library, Inc., 15 East 40th St., New York 16, N. Y. $10.00.

Transformers and Generators for Power Systems—by R. Langlois-Berthelot. 541 pages. Philosophical Library, Inc., 15 East 40th St., New York 16, N. Y. $12.00.

Fundamentals of Rocket Propulsion—by Raymond E. Wiech, Jr. and Robert F. Strauss. 135 pages. Reinhold Publishing Corp., 430 Park Ave., New York 22, N. Y. $5.50.

Reinforced Concrete Reservoirs and Tanks—by W. S. Gray. Fourth Edition. 189 pages. Concrete Publications Limited, 14 Dartmouth St., London S.W. 1, England. $2.80.



PAUL BUNYAN'S BOWLING BALL PROVES BEARINGS!

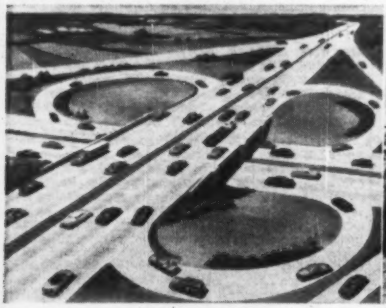
This game of tenpins would have been fine sport for Paul Bunyan, yet it would have taxed even *his* strength to clear as much as 50 acres an hour with this gigantic ball. Today, giant 'dozers do the job with ease. Nearly every leading make is equipped with Bower Straight and Tapered Roller Bearings – with proven ability to stand up under back-breaking pressure. Manufacturers look to Bower for improved bearing design and painstaking quality control that make Bower bearings last longer, need less maintenance. When you require bearings, select from Bower's complete line of tapered, straight and journal roller bearings for every field of transportation and industry. Bower Roller Bearing Division, Detroit 14, Michigan.

BOWER
ROLLER BEARINGS

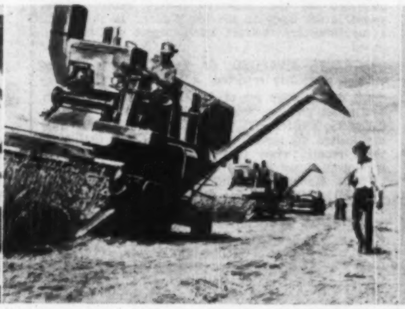
tapered
cylindrical
journal

DIVISION OF
FEDERAL-MOGUL-BOWER
BEARINGS, INC.

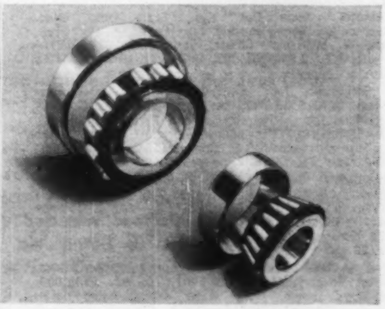
AUTOMOTIVE. Bower roller bearings are designed and constructed to stand up indefinitely with little or no attention.



AGRICULTURE. Breakdowns in equipment are costly. That's why farm equipment makers use Bower roller bearings.



BOWER'S BROAD LINE of tapered, cylindrical and journal roller bearings are used in virtually every industry.



CIRCLE 197 ON READER SERVICE CARD

Construction Reports

Bids Asked—Low Bidders—Contracts Awarded

Compiled by Business News Department—Engineering News-Record, 330 W. 42nd St., New York 36, N. Y., ELSIE EAVES, Manager J. A. MAHONEY, M. WETZEL, M. E. SCIORRA, MARIE MORAVSIK, ELEANOR QUERET, Reports, J. H. WEBBER, E. R. HUBER, Statistics. E. R. HUBER, Statistics.

NEW ENGLAND

HEAVY CONSTRUCTION—BA

Conn., Stratford—BA 9/28—Town, Town Hall, sanitary sewers, Silver Lane; North-West Sewage Pumping Station, $300,000. Extended date. CD 8/24.

† **Mass., Fall River**—BA 9/30—Dist. P. Wks. Office, First Naval Dist., 495 Summer St., Boston, Zone 10, rehabilitation fresh water lines and back flow prevention device, U. S. Naval Reserve Training Center, NBy 34394, Spec. 34394/60. Under $10,000.

BUILDINGS—BA

Mass., Westwood—PLANT—BA 9/26—Southwest Park Trust Co., c/o Nordblom Co., 50 Congress St., Boston, (selected list of bidders), industrial plant, Southwest Industrial Park. $120,000. Philip Wainwright, 50 Congress St., Boston, archt.-engr. CD 8/8.

▲ **Conn., Hartford**—HIGH SCHOOL—BA 9/27—Bd. Educ., 249 High St., limestone, brick high school. $6,750,000. Plans deposit $160. Extended date. CD 9/7.

Me., Bar Harbor—SCHOOL—BA 9/27—Town, Supt. Schools, Eagle Lake Rd. Junior High School, Eagle Lake Rd. $400,000. Alonzo J. Harriman, Inc., 292 Court St., Auburn, archt. CD 2/17.

R. I., Providence—LABORATORY—BA 9/29—Brown University, Div. Planning & Bldgs., Prospect St., (selected list of bidders), heavy engineering laboratory. $700,000. Sherwood, Mills & Smith, 65 Broad St., Stamford, Conn., archts. CD 7/20, under LB.

▲ **Mass., Framingham**—HOSPITAL—BA 10/7—Commonwealth of Mass., Dpt. Mental Health, Div. Bldg. Constr., 38 Chauncy St., Boston, Proj. M-729, Contr. 7, renovate Cushing Hospital. $1,176,311. Plans deposit $100. Desmond & Lord, 6 Beacon St., Boston, archts. CD 2/11/59.

Mass., Rowe—SCHOOL—BA 10/11—Town, School Dpt., elementary school. $450,000. Plans deposit $50. Webber & Erickson, 56½ Merchants Row, Rutland, Vt., archts. Jennison Engineering, Inc., 95 College St., Burlington, Vt., mechanical engr. CD 6/11/59.

Mass., Revere—HOUSING—BA 10/17—City Housing Auth., 70 Coolidge St., Mass. 14-2 Housing Proj., Adams and Gordon Sts. $721,000. Plans deposit $100. Harold M. Turiello, 1025 Revere Beach Parkway, archt. CD 7/10/58.

BUILDINGS—SLC

Conn., Forestville—SCHOOL, etc.—St. Matthew's R. C. Church, 120 Church St., soon lets contract, 2 story school and 2 story convent, Welch Dr. $450,000. Plans deposit $50. Schilling & Goldbecker, 18 Trumbull St., New Haven, archts. Jerome F. Mueller, 15 Lewis St., Hartford, engr. CD 9/31.

Mass., Framingham—CHURCH—First Methodist Church, 30 Elm St., Saxonville, soon lets contract church, Saxonville Section. $400,000. Bastille-Halsey Assoc., 120 Tremont St., Boston, archts.

Mass., Holbrook—SUPERMARKET—Stop & Shop, Inc., 393 D St., South Boston, soon lets contract, supermarket. $400,000. CD 9/8.

Mass., Watertown—HOUSING—Owner, c/o Lester N. Lechter, archt., 739 Boylston St., Boston, soon lets contract 90 unit apartment. $450,000. CD 8/19.

N. H., Concord—PLANT—Concord Lithograph Co., 59 Old Turnpike Rd., soon lets contract plant addn. $112,000. Horace G. Bradt, Linden St., Exeter, engr.

R. I., Lincoln—BOWLING ALLEY—Raymond J. Van Dale, 100 Chapel St., soon lets contract, bowling alley, Smithfield and Higginson Aves. $400,000. CD 8/31.

HEAVY CONSTRUCTION—LB & CA

NEW HAMPSHIRE—Dpt. P. Wks. & Hys., Concord,
E. V. DelDuca Constr. Co., Inc., 290 Broadway, Methuen, Mass., CA **$658,134**, hot b. conc. roadway, two bridges, 0.464 mi. Salem, Rockingham Co. Bids June 23. CD 7/5, under LB.

VERMONT — State Dpt. Hys., State Office Bldg., Montpelier, Bids opened 9/9,
Frank W. Whitcomb Constr. Corp., Box 429 Bellows Falls, Vt., LB **$156,097**, S-0130-(1), Hy. SA Rd. No. 1, Danby.

M. Solimando, Inc., 584 Columbia Rd., Dorchester, Mass., CA **$517,200**, est. $500,000, Contr. 1214, artificial ice skating rink, Marine Park, South Boston, MASSACHUSETTS. Commonwealth of Mass., Metropolitan Dist. Comn., 20 Somerset St., Boston, Mass. Bids July 26. CD 8/2, under LB.

Pinn Constr. Co. Inc., 105 Woodland St., Holliston, Mass., CA **$214,618**, est. $135,000, animal nursery, Franklin Park Zoo, DORCHESTER, MASS. Commonwealth of Mass., Metropolitan Dist. Comn., Parks Div., 20 Somerset St., Boston, Mass. Bids Sept. 6. CD 8/22.

Salah & Pecci Constr. Co., Inc., 1605 V.F.W. Parkway, West Roxbury, Mass., LB **$447,670**, est. $500,000., sanitary sewers, storm water drains, catch basins, various streets, LOWELL, MASS. City of Lowell, P. Wks. Comr., City Hall, Lowell, Mass. Bids Sept. 7. CD 9/1.

Grognale Constr. Co., Inc., 13 Byrd Ave., Roslindale, Mass., LB **$186,945**, est. $175,000, Contr. 1960—2 water mains, PITTSFIELD, MASS. City, Comr. P. Wks., City Hall, Pittsfield, Mass. Bids Sept. 7. CD 8/26.

City of Norwalk, Water Dpt., Second Dist., City Hall, South Norwalk, Conn., Owner Builds, **$120,000**, foundation and water stand pipe, Witch Lane; foundation and steel water tank, Michales St., SOUTH NORWALK, CONN. CD 4/16/59.

BUILDINGS—LB & CA

Pizzagalli Constr. Co., San Remo Industrial Park, S., Burlington, Vt., CA **$115,000**, INDUSTRIAL PLANT, COLCHESTER, VERMONT. Ladd Research Industries, Colchester, Vt.

D. A. Sullivan & Sons, Inc., 82-84 North St., Northampton, Mass., CA **$684,578**, U-58-5 Contr. 1, ENGINEERING and PHYSICS SHOPS, University of Massachusetts, AMHERST, MASS. Commonwealth of Mass., Dpt. Educ., Div. Bldg. Constr., 38 Chauncy St., Boston, Mass. Bids Aug. 26. CD 8/31, under LB.

Martin Cerel Co., Rte. 9, Natick, Mass., Owner Builds, Approx. **$400,000**, 24 HOUSES, Beacon Light off Rte. 3A, BILLERICA, MASS.

DeStefano Constr. Co., 311 Washington St., Brighton, Mass., LB **$806,275**, H-59-4 Contr. 1, NURSES HOME, Mass. Hospital School, CANTON, MASS. Commonwealth of Mass., Dpt. Public Health, Div. Bldg. Constr., 38 Chauncy St., Boston, Mass. Bids Sept. 2, awarded Sept. 8. CD 9/8, under LB.

Alpha Structural Co., Inc., 372 Winter St., Waltham, Mass., CA Est. **$112,000**, INDUSTRIAL PLANT, CHELMSFORD, MASS. Owner, c/o contractor.

▲ **Rocheford Constr. Co.**, P. O. Box 369, Framingham, Mass., LB **$1,033,800**, est. $1,000,000, ELEMENTARY SCHOOL, Water St., FRAMINGHAM, MASS. Town, 49 Lexington St., Framingham, Mass. Bids Sept. 8. CD 8/12.

▲ **E. J. Pinney Co., Inc.**, 220 Dwight St., Springfield, Mass., LB **$1,085,700**, Spring Box JUNIOR-SENIOR HIGH SCHOOL, Rte. 202, Clark Property, GRANBY, MASS. Town, Town Hall, Granby, Mass. Bids Sept. 8. CD 7/26.

PROJECTS COVERED

By Size

Construction projects here reported cover the United States and Canada, are of these minimum sizes or larger: water supply, earthwork, waterways $53,000; other public works $88,000; Industrial buildings $110,000; other buildings $400,000. Also Foreign projects of $1,000,000 and more in size of Interest to American contractors.

By Regions & Classes of Construction

(In order of Listing)

BIDS ASKED
LOW BIDDERS
CONTRACTS AWARDED
New England
Middle Atlantic
South
Middle West
West of Mississippi
Far West

PROPOSED WORK
Water Supply
Sewers, Waste Disposal
Bridges
Streets & Roads
Earthwork, Waterways
Public Buildings
Mass Housing
Commercial Buildings
Industrial Buildings
Unclassified

In These Stages

PROPOSED WORK: Before and including appointment of engineers or architects.
BIDS ASKED: BA (new announcements only). For full calendar, see also preceding issues.

SOON LETS CONTRACT: SLC

LOW BIDDERS: LB On jobs below $500,000 in value all low bidder news will be the final reports published on the projects involved except where award is not made to the low bidder. In this case, a supplementary contract award report will be published.

CONTRACTS AWARDED: CA Except awards to low bidders previously reported n low bidder stage.

CD dates shown are of Construction Daily Issue in which last previous report was published.
OWNERS, ENGINEERS, ARCHITECTS, CONTRACTORS are invited to report their new jobs for listing in these reports when they meet or exceed the size minimums shown above. Address these news releases to J. A. Mahoney, REPORTS, ENGINEERING NEWS-RECORD, 330 W. 42 St., New York 36, N. Y.

Symbols and Abbreviations Include:

†	Federal Government
▲	Project of $1,000,000 or over.
ENR	Engineering News-Record
CD	Construction Daily

For additional reports see Construction Daily.

▲ **Granger Contg. Co., Inc.**, 306 Main St., Worcester, Mass., CA **$1,257,590**, est. $1,194,000, JUNIOR-SENIOR HIGH SCHOOL, Holliston and Kelly Sts., MEDWAY, MASS. Town, Town Hall, Medway, Mass. Bids Aug. 11. CD 7/18.

Owner, c/o Allen Realty Co., 5A Union St., Lynn, Mass., Owner Builds, Approx. **$418,000**, 22 HOUSES, Green Meadows, Lake St. off Rte. 120, PEABODY, MASS.

† **Dist. P. Wks. Office, 1ND**, 495 Summer St., Boston 10, Mass., rejected bids June 29, conversion of Squantum Gardens to PUBLIC QUARTERS, Squantum Section, NBy 29548, Spec. 29548/59, QUINCY, MASS. **$250,000-$750,000**. CD 6/6.

▲ **M. J. Walsh & Son, Inc.**, 14 Shawmut Ave., Holyoke, Mass., CA **$1,084,400**, Base Bid INTERMEDIATE SCHOOL, SOUTH HADLEY, MASS. Town, School Dpt. Office, 38 Carew St., South Hadley, Mass. Bids Sept. 1. CD 9/6, under LB.

Thomas C. Vincent, Inc., 327 Northrop Ave., Mamaroneck, N. Y., LB **$206,500**, est. $200,000, M-820-2 POWER PLANT, State Hospital, WALTHAM, MASS. Commonwealth of Mass., Metropolitan State Hospital, Dpt. Mental Health, c/o Div. Bldg., Constr., 38 Chauncy St., Boston, Mass. Bids Sept. 9. CD 8/17.

Martin Cerel Co., Rte. 9, Natick, Mass., Owner Builds, Approx. **$406,000**, 14 HOUSES, Springdale, Loker St., WAYLAND, MASS.

▲† **The Ferber Co.**, 16 Johnson Ave., Hackensack, N. J., LB **$8,047,500**, est. $8,250,000, CAPEHART HOUSING. NBy 29544, Spec. No. 29544/59, Anchorage and Melville, NEWPORT, R. I. U. S. A. First Naval Dist., 495 Summer St., Boston, Mass. CD 8/26.

Del Signore Constr. Corp., 1 Pleasant View St., Worcester, Mass., LB approx. **$550,000**, TEMPLE and SCHOOL, 224 Prospect St., WOONSOCKET, R. I. Temple B'nai Israel Bldg. Comn., Woonsocket, R. I. CD 8/1.

John C. Smith, Inc., Baldwin Ave., New Canaan, Conn., CA **$400,000**, SUPERMARKET, Elm St., NEW CANAAN, CONN. A. & P. Super Market, Elm St., New Canaan, Conn. Awarded Sept. 8.

▲ **J. S. Nasin Co.**, N. Windham Rd., Willimantic, Conn., LB **$1,465,000**, (6 bidders), JUNIOR HIGH SCHOOL, Ox Hill Rd., NORWICH, CONN., Town, Bd. Educ., City Hall, Norwich, Conn. CD 8/16.

A. A. Canzler, Padanaram Rd., Danbury, Conn., LB **$636,949**, 1 story, steel frame, concrete, ELEMENTARY SCHOOL, Old Newtown Rd., STEPNEY DEPOT, CONN. Town of Monroe, Bd. Educ., R. F. D. No. 1, Stepney Depot, Conn. CD 7/21.

Waterbury Constr. Co., Inc., 25 Hillside Ave., Waterbury, Conn., CA **$405,000**, SCHOOL ADDN., 625 Baldwin St., WATERBURY, CONN. St. Francis Xavier R. C. Church, 625 Baldwin St., Waterbury, Conn. Louis R. Fucito, 37 Hillside Ave., Waterbury, Conn., archt.

New England General Contg. Co., 341 State St., New Haven, Conn., CA **$250,000**, WAREHOUSE, Dart Lane, WEST HAVEN, CONN. National Biscuit Co., 943 Dixwell Ave., Hamden. Conn. CD 9/1.

▲ **Anderson-Fairoaks, Inc.**, 227 Newfield Ave., Hartford, Conn., LB **$2,770,000**, Proj. BI-2B-93, 3 story, stone concrete State Labor Dpt. OFFICE BLDG., Jordan Lane, WETHERSFIELD, CONN. State P. Wks. Comr., 165 Capitol Ave., Hartford, Conn. CD 8/12.

Bernard I. Friedman, 750 Main St., Hartford, Conn., Owner Builds, **$850,000**, 170 unit Garden APARTMENTS, Folly Brook Blvd., WETHERSFIELD, CONN. Irving W. Rutherford, 301 Farmington Ave., Hartford, Conn., archts.

MIDDLE ATLANTIC

HEAVY CONSTRUCTION—BA

† **N. Y., East Moriches**—POLE FRAME BUOY SHED—BA 9/26—Contracting Officer, Third Coast Guard Dist., Custom House, New York, Zone 4, constr. pole frame buoy shed, Moriches Lifeboat Station, IFB 03-49604-11.

† **New York and New Jersey**—NIKE-HERCULES CONTROL SYS.—BA 9/27—U. S. Eng., 111 E. 16 St., New York 3, N. Y., Nike-Hercules control sys. at Special AAA Facilities, various locations in New York and New Jersey, Schedules I-III, ENG-30-025-61-21. Total est. $900,000. CD 7/19/55.

Pa., Phila.—BA 9/27—Dpt. Procurement, City Hall Annex, Bid No. 2628, cleaning and cement, mortar lining and replacing line valves in 20 and 16 in. c.i. water mains in various locations; Bid No. 2629, cleaning and cement, mortar lining and replacing line valves in 6- to 12-in. c.i. water mains in various locations; Bid No. 2630, cleaning and cement, mortar lining and replacing line valves in 24- to 60-in c.i. water mains in various locations; Bid No. 2631, waterproofing exterior walls, painting exterior steel windows and doors and appurtenant work at Pre-Treatment Chemical Bldg., 3545 Fox St., for Water Dpt. CD 11/8/58.

† **Pa., Willow Grove**—DORMITORY—BA 9/27—Dist. Public Works Officer, 4th Naval Dist., Phila., U.S.A.F. facilities dormitory, Naval Air Station, IFB 27053/60B.

† **New Jersey**—BA 9/28—U. S. Eng., 111 E. 16th St., New York 3, N. Y., dredging 192,970 cu. yd., South Channel Raritan River, CIVENG-30-075-61-4. $200,000.

N. Y., Buffalo—BA 9/29—Erie County Water Auth., 338 Ellicott Square Bldg., Zone 3, 1 story 36x68 ft. rein.-con. substructure and brick superstructure complete with 3 electric motor driven centrifugal-pumping units, piping, electrical equip., controls, and wiring, heating, plumbing, grading, connecting piping, etc. Windom Pumping Station, Orchard Park. Plans deposit $25. Buck, Seifert & Jost, 112 East 19 St., New York 3, N. Y., consult. engrs.

N. Y., New York—BA 10/3—Dpt. P. Wks., Rm. 1800L, Municipal Bldg., Zone 7, Contr. 5, Rikers Island Sanitary Sewer, Rikers Island Penitentiary, Bronx Boro. Plans deposit $20. CD 9/18/57, under Public Buildings.

N. Y., Poughkeepsie—BA 10/4—City, City Hall, Contr. 60-5, trunk sewer and force main, 8th Ward. $500,000. Extended date. CD 8/23.

† **Md., Carderock**—APPLIED MATH BLDG. EXTENSION—BA 10/5—Area P. Wks. Office, Chesapeake, U. S. Naval Weapons Plant, Wash., D. C., Applied Math Bldg. 17 extension, David Taylor Model Basin, NBy-32416, $100,000-$250,000. CD 7/26.

N. Y., Brooklyn—DEMOLITION and DREDGING—BA 10/6—Office Ch. Engr., Port of New York Auth., Rm. 1100, 111 Eighth Ave., New York 11, Contr BP-190.006, demolition of existing Piers 18 and 24 and dredging for Piers Nos. 6 and 7, Brooklyn-Port Authority Piers. Plans deposit $30. CD 1/17/57.

N. Y., Brooklyn—BA 10/10—Dpt. P. Wks., Rm. 1800L, Municipal Bldg., New York, Zone 7, Contr. 5, South Branch Intercepting Sewer, west side, West St., for Newtown Creek Pollution Control Project, Manhattan and Brooklyn Boros. Plans deposit $80. CD 11/16/44.

BUILDINGS—BA

▲ **N. Y., Brooklyn**—SCHOOL—BA 9/27—Supt. Design, Constr. and Physical Plant, Bureau of Constr., 4 Fl., 42-15 Crescent St., Long Island City, Zone 1, general contr., plumbing and drainage, heating and ventilating, electrical work and lighting fixtures for P. S. 257 Varet and Humboldt Sts., Brooklyn Boro. Extended Date. Plans deposit $25 for general, $10. mechanical trades. CD 8/31.

N. Y., Hempstead—ADMINISTRATION—BA 9/28—Hofstra College, 1000 Fulton Ave., general contract, 3 story, bsmnt., 40,000 sq. ft. administration bldg. and parking area. $400,000. Edward Coe Embury, 699 Madison Ave., New York, archt. CD 8/8.

N. Y., Smithtown—SCHOOL—BA 10/4—Bd. Educ. Central School Dist. No. 1, Junior High School addn., New York Ave. $800,000. Plans deposit $25. Ketchum & Sharp, 227 E. 44 St., New York, archts. CD 7/12.

Pa., Lancaster—EDUCATION CENTER—BA 10/5—Franklin & Marshall College, Physical Education Center, gymnasium and swimming pool, $970,000. Plans deposit general contract $100; others $70. William H. Lee, 6 Penn Center Plaza, Phila., archt. Charles H. Wolf, 112 S. 16th St., Phila., engr. CD 2/27/59.

Pa., Phila—UTILITY—Bids Asked—Cronheim & Weger, archts. 220 S. 16th St., (selected list of bidders), 1 story, 50 x 375 ft. masonry, steel utility building for Northern Metal Co., Milnor and Bleigh Sts. $125,000.

BUILDINGS—SLC

▲ **N. Y., Brookville**—DORMITORIES, etc.—Long Island University, C. W. Post College, Northern Blvd., soon lets contract, two 3 story, 44x225 dormitories and kitchen and dining hall addns. $2,500,000. Plans deposit $75. Kelly & Gruzen, 10 Columbus Circle, New York, N. Y., archts. James Mongitore Assoc., 101 Park Ave., New York, N. Y., engrs.

Pa., Phila.—DRY STORAGE—National Refrigerated Terminals, Delaware and Oregon Aves., soon lets contract, dry storage addn., alterations. $750,000. V. C. Patterson & Assoc., Inc., 30 E. King St., York, engr.

Pa., Southampton—CHURCH—Our Lady of Good Council R.C. Church, soon lets contract, church, Over $400,000. Sabatino & Fishman, 116 S. 19th St., Phila., Pa., archts. Axel Schulze, Belvoire and Johnson Rds., Norristown, engrs. CD 11/20/57.

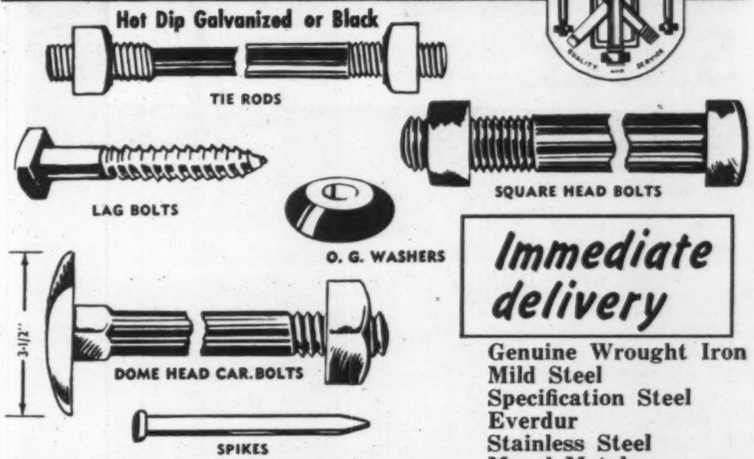
HEAVY CONSTRUCTION—LB & CA

▲ **Lasker-Goldman Corp.**, 50 E. 42 St., New York 13, N. Y., CA **$2,394,000,** general contract superstructure for shopping terminal, foot of 39 St. Gowanus Bay, BROOKLYN, N. Y. Comr. Marine & Aviation, Battery Maritime Bldg., foot of Whitehall St., New York 4, N. Y. Bids July 20, CD 7/27, under LB.

Almeda Foundations, Inc., 30 Almeda Ave., Buffalo, N. Y., LB **$62,697,** Phase 3, concrete slope walls Cazenovia Creek Flood Control Proj., BUFFALO, N. Y. City, City Hall, Buffalo, N. Y. Bids Aug. 11. CD 2/17/59.

S. & S. Constr. Co., Box 422, South Fallsburg, N. Y., LB **$109,273,** (5 bidders), Contr. 2, 23,000 ft. 6- to 10-in. asbestos cement water mains, reservoir fdn.; LB **$148,510,** (5 bidders), Contr. 3, constr. 1 m.g. steel reservoir, FALLSBURGH, N. Y. Town Bd., Town Hall, Fallsburgh, N. Y. Bids Sept. 8. CD 8/23.

HARDWARE For HEAVY CONSTRUCTION



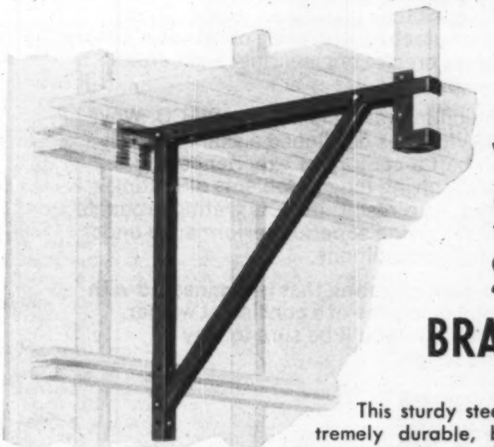
Immediate delivery

Genuine Wrought Iron
Mild Steel
Specification Steel
Everdur
Stainless Steel
Monel Metal

JERSEY BOLT & SPIKE CORPORATION
MANUFACTURERS • FABRICATORS

Plant and Main Office: 21 Humphreys Ave., Bayonne, N. J., P.O. Box 5103, Newark, N. J.
Direct Line: New Jersey MArket 3-0333 • New York REctor 2-3958
CIRCLE 35 ON READER SERVICE CARD

Eliminate Dangerous Makeshift Scaffold Supports!



with NEW SUPERIOR SCAFFOLD BRACKET (JACK)

This sturdy steel Scaffold Bracket is extremely durable, being far stronger than the minimums required by State Building Codes. The bracket may be quickly adjusted for connecting to either 2 x 4 or 2 x 6 wales, or flush with the concrete face. (Illustration shows the 2 x 4 position.)

One of the many advantages is the *fold-down* feature which saves considerable space in storing and shipping. Why not stop using hazardous makeshift scaffold supports and specify Superior Scaffold Brackets—made of steel—virtually indestructible. May be rented as well as purchased outright. *Write for Bulletin OF3.* **Superior Concrete Accessories, Inc., 9301 King St., Franklin Park, Illinois**

PRECISION AND SKILL

GO INTO A GOOD GRATING

Making a top-quality grating requires as much precision and skill as playing an expert game of golf. The manufacture of grating demands a history of experience, precise engineering, and careful workmanship.

The champion in grating is always IRVICO. Why? Because IRVICO has developed a skill based on more than half a century of experience and know-how in solving tough problems of grating engineering. As a result, IRVICO grating products are known for giving superior performance under the most trying conditions.

When you want a grating that is engineered with the rigorous discipline of a consistent winner, specify IRVICO... you'll be sure to stay "out of the rough."

IRVICO

Catalog on request

IRVING SUBWAY GRATING CO., Inc.

ORIGINATORS OF THE GRATING INDUSTRY
EST. 1902

Offices and Plants at:
5063 27th St., LONG ISLAND CITY 1, N. Y.
1863 10th St., OAKLAND 20, CALIFORNIA

William Clemente, 103-44 98 St., Ozone Park, N. J., LB **$56,900,** water mains, Bergen, Ewen, Sampson and Swinton Aves., Hewitt, Macy and Sage Places, Bronx Boro, NEW YORK, N. Y. Comr. Water Supply, Gas & Electricity, Rm. 2351, Municipal Bldg., New York 7, N. Y. Bids Sept. 9. CD 8/31.

Lizza & Sons, Inc., 152 South St., Oyster Bay, N. Y., LB **$441,465,** (9 bidders), paving, grading, drainage Taylor Ave., Indian Head Rd., Smithtown, RIVERHEAD, N. Y. Suffolk Co., Dpt. P. Wks. Court House, Riverhead, N. Y. Bids Sept. 8. CD 8/19.

▲ **NEW JERSEY**—State Hy. Dpt., 1035 Parkway Ave., Trenton, Bids opened 9/8,

Poirier & McLane Corp., 33 W. 42 St., New York, N. Y., LB **$4,274,495,** (9 bidders), grading, paving and bridges 3.536 mi. Interstate Rte. 287, Section 2C from east of River Rd. interchange to Stelton Rd., South Plainfield Boro and Piscataway Twp., Middlesex Co. CD 8/22.

▲ **Horn Constr. Co. Inc.,** 2174 Hewlett Ave., Merrick, N. Y., CA **$1,573,650,** Contr. EP-110-004 wharf, Berth 50, Elizabeth-Port Authority Piers, ELIZABETH, N. J. Port of New York Auth., 111 8 Ave., New York 11, N. Y. Bids Sept. 7, awarded Sept. 8. CD 9/9, under LB.

A. C. Schultes, 401 Mantua Pike, Woodbury, N. J., LB **$68,950,** water supply and well imprvs., WOODBURY, N. J. West Deptford Twp. Committee, Woodbury, N. J. Remington & Boyd, Pennsauken, N. J., engrs.

† **Agnew-Joseph Co.,** Ronceverte, W. Va., CA **$179,774,** repairing guide wall and lock walls, Lock and Dam No. 16, Ohio River, CIVENG-46-022-61-4B, PENNSYLVANIA and WEST VIRGINIA, U. S. Eng., 502 8th St., Huntington, W. Va. Bids Aug. 16. CD 7/27.

† **Lycoming Constr. Co., Inc.,** 127 Susquehanna St., Williamsport, Pa., CA **$746,236,** Brookville Flood Protection Proj., North Fork, Redbank and Sandy Lick Creeks, Brookville, CIVENG-36-058-61-1, PENNSYLVANIA. U. S. Eng., 925 New Federal Bldg., Pittsburgh 19, Pa. Bids 8/18. CD 7/26.

Bray-Bros., Tullytown Rd., Fallsington, Pa., CA **$110,000,** athletic fields, FALLSINGTON, PA. Pennsburg Joint School Bd., Yardley Rd., Fallsington, Pa.

Paul A. Martin, Inc., Mount Joy, Pa., LB **$185,681,** (5 bidders), general contract, terminal bldg. addn., Harrisburg-York State Airport, Fairview Twp., HARRISBURG, PA. CD 8/29,

Howard P. Foley Co., 31st and Revere Sts., Harrisburg, Pa., LB **$92,830,** (2 bidders), electrical contract, terminal addn., (Harrisburg, Pa.).

D & C Spinosa Co., 2 N Jerome St., Allentown, Pa., LB **$245,432,** Bid 2618 water mains, PHILA., PA. Dpt. Procurement, City Hall Annex, Phila., Pa. Bids Aug. 30, CD 8/23.

Mar-Real Constr. Co., 1331 Porter St., Phila., Pa., LB **$332,248,** sewers. Bid 2621, PHILA., PA. Dpt. Procurement, City Hall Annex, Phila., Pa. CD 8/23.

Whiting-Turner Contg. Co., 6629 N. Charles St., Baltimore, Md., LB **$96,201,** Bridge No. 235, repairs, Bid. 3811, PHILA., PA. Dpt. Procurement, City Hall Annex, Phila., Pa. CD 2/3/47.

MARYLAND—State Rds. Comn., 300 W. Preston St., Baltimore, Zone 3, Bids opened 9/6,

Geo. F. Hazelwood, Cumberland, Md., LB **$513,579,** (5 bidders) grading, drainage, relocation, reconstr. and surf. 1.723 mi. US 219 Hoyes Rd. toward McHenry, G-271-10-620, Garrett Co. CD 8/24.

MARYLAND—State Rds. Comn., 300 W. Preston St., Baltimore, Zone 3, Bids opened 9/6,

Md.—**W. T. Campbell Constr. Co.,** Frederick, Md., LB **$609,303,** (8 bidders), Dead Run culverts and bridge fdns. Interchange Area, Rtes. 70N & 695 near Catonsville, B 721-11-423, Baltimore Co.;

Md.—**J. Melvin Roberts,** Cockeysville, Md., LB **$204-583,** est. $100,000-$250,000 (12 bidders) dual 4 span steel beam bridges on Baltimore Beltway over Perring Parkway near Baltimore, B-635-73-420, Baltimore Co. CD 8/17.

MARYLAND—State Rds. Comn., 300 W. Preston St., Baltimore, Zone 3, Bids opened 9/6,

Md.—**George & Lynch,** Delaware Trust Bldg., Wilmington, Del., LB **$118,633,** (6 bidders), 6 span steel beam bridge on relocated Md. 318, Federalsburg By-Pass, CO-253-6-220, Caroline Co.;

Md.—**E. H. Nunn Constr. Co.,** Jessup, Md., LB **$173,670** (7 bidders), steel beam bridge over Morse Rd. and Phillips Mill Rd. on relocated Rte. 23, H-438-4-420, Harford Co. CD 8/24.

▲ **Joseph Reddington,** 2120 Annapolis Rd., Baltimore, Md., LB **$1,098,183,** (4 bidders), Contr. 1590, pave, drainage, Patapsco Ave., BALTIMORE, MD. City, Bureau Hys., 303 Municipal Bldg., Baltimore 2, Md. Bids Sept. 7. CD 8/29.

McLean Constr. Co., Fidelity Bldg., Baltimore 1, Md., CA **$804,547,** 28 St. Bridge and connecting ramps over Jones Falls Expressway, BALTIMORE, MD. City, Bureau Hys., 303 Municipal Bldg., Baltimore 2, Md. Bids Aug. 1. CD 8/17, under LB.

C. F. & B. Inc., 5200 46 Ave., Edmonston, Md., LB **$274,915,** (5 bidders), Contr. 114-D&S, storm drains and sanitary sewers from Lafayette Ave. to Baltimore Ave., Riverdale, HYATTSVILLE, MD. Washington Suburban Sanitary Comn., Hamilton St., Hyattsville, Md. Bids Sept. 7. CD 8/30.

▲ **Blount Bros. Constr. Co.,** 79 Commerce St., Montgomery, Ala., CA **$2,488,673,** Washington Channel bridge superstructure, WASH., D. C. D. C. Govt., Dpt. Hys., 499 Pennsylvania Ave. N. W., Wash., D. C. CD 9/1.

† **Helsing Bros. Co., Inc.,** 4207 39th St. N.W., Wash., D. C., LB **$115,857,** (7 bidders), tennis courts, fencing and miscellaneous work at East Potomac Park, WASH.,

WEATHERTITE
POSITIVE SEAL for CONTROL JOINTS

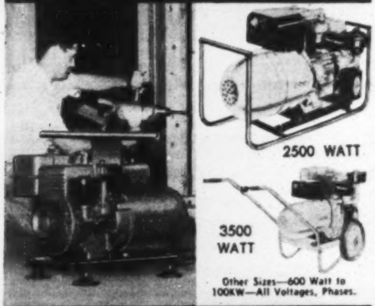
WEATHERTITE "R"
BUILDING PAPER
MORTAR
CALKING
MICHIGAN CONTROL JOINT

To safeguard against cracks in block-constructed masonry walls, always use an approved Control Joint. To prevent water seepage through these control joints, always use WEATHERTITE seals. Two types are available: WEATHERTITE "R" for Michigan Control Joints; WEATHERTITE "RB" for Besser Control Joints. WEATHERTITE is a specially shaped strip of expanded Polyvinyl-Chloride which provides a permanent and effective watertight seal in standard control joints. See Sweet's Architectural File, or write for information on WEATHERTITE; EVERLASTIC GASKETS for stone coping, sills, masonry wall panels, etc.; and WATERSTOPS for sealing construction joints between cast-in-place concrete members.

WILLIAMS
EQUIPMENT and SUPPLY CO.
456 W. Eight Mile Rd., Hazel Park, Mich.

CIRCLE 36 ON READER SERVICE CARD

PORTABLE POWER
CUTS YOUR COSTS



USE POWER TOOLS WITH DEPENDABLE
WINPOWER ELECTRIC PLANTS

You save 4 big ways with a WINPOWER electric plant:
(1) automatically idles plant when load is off . . . cuts fuel cost . . . lowers noise . . . extends engine life;
(2) costs less to buy . . . priced to beat all competition;
(3) speeds up production by supplying low cost, instant power on the job;
(4) gives you long and dependable service backed by 35 years of manufacturing experience. Portable cradle units or two wheel dolly types.

FREE BROCHURE AND COMPLETE INFORMATION SENT BY RETURN MAIL.

WINPOWER MFG. CO.
Dept. ENR NEWTON, IOWA

CIRCLE 39 ON READER SERVICE CARD

D. C. National Park Service, Dpt. Interior, 19 and C Sts. N.W., Wash. 25, D. C. Bids Aug. 23, CD 8/25.

Washington Contractors, 9th and Brentwood Rd. N. E., Wash., LB **$182,888,** (5 bidders), covering various roadways with asphaltic surface (First Fall Cover Contract—1960) WASH., D. C., D. C. Govt., Dpt. Hys., 499 Pennsylvania Ave. N. W., Wash., D. C. Bids Sept. 9. CD 9/6.

BUILDINGS—LB & CA

† **Malan Constr. Corp.,** 2 Park Ave., New York 16, N. Y., LB **$860,000,** (8 bidders), 58,000 sq. ft. EXPERIMENTAL BLDG., Brookhaven National Laboratory, BROOKHAVEN, N. Y. Administrative Officer, Alternating Gradient Synchrotron Proj., Bldg. 911, Brookhaven National Laboratory, Upton, N. Y. Bids Sept. 8. CD 8/16.

▲ **John W. Rouse Constr. Corp.,** Gouverneur, N. Y., LB **$2,200,043,** FINE ARTS BLDG., Buffalo State University, BUFFALO, N. Y. State Dpt. P. Wks., State Office Bldg., Albany, N. Y. Bids Sept. 7. CD 8/9.

Calsa Contg. Co., Inc., 805 Smith St., Baldwin, N. Y., CA **$150,000,** 1 story, no bsmnt., 100x100 ft. FACTORY, Stonehimge Lane, CARLE PLACE, N. Y. Owner, c/o Joseph L. De Marco, archt., 170 Bethpage Rd., Farmingdale, N. Y.

Anzel Constr. Corp., 11 W. Sunrise Hy., Freeport, N. Y., LB **$300,000,** FACTORY, Cantiague Rd., HICKSVILLE, N. Y. Lagin Lamps, 51 W. 24 St., New York, N. Y. Irving Hirshman, 280 Northern Blvd., Great Neck, N. Y., archt.

▲ **New York City Housing Auth.,** 299 Broadway, New York 7, N. Y., cancelled bids to have been opened Sept. 11, Borgia Butler HOUSES, Proj. NYS084, 990 units, Bronx Boro, NEW YORK, N. Y. **$28,000,000.** Joseph & Vladeck, 1841 Broadway, New York, N. Y., archts. Will re-advertise. CD 7/14.

▲ **Wilaka Constr. Co., Inc.,** 11 E. 44 St., New York 17, N. Y., LB **$1,606,000** Base Bid (6 bidders), general contract PUBLIC SCHOOL 161, W.133 St. between Amsterdam and Convent Aves., Manhattan Boro, NEW YORK, N. Y. Supt. Design, Constr. & Physical Plant, Bureau Constr., 4 Fl., 42-15 Crescent St., Long Island City 1, N. Y. Bids Sept. 9. CD 8/9.

Benderson Development Co., 123 Franklin, Buffalo, N. Y., Owner Builds, Over **$700,000,** 70,000 sq. ft. STORE, Eggert and Colvin Rds., TONAWANDA, N. Y. Twin Fair Stores, lessee.

Detor Constr. Co., 524 Hunt Ave., Syracuse, N. Y. CA **$618,500,** HIGH SCHOOL, TRUMANSBURG, N. Y. Bd. Educ., Trumansburg, N. Y. CD 7/6, under LB.

Albert Feibel, 94 Greenwood Dr., Millburn, N. J., Owner Builds, **$500,000,** 16 addn. HOUSES, Prospect St., BERNARDSVILLE, N. J. Daniel Washington, Long Hill Rd., Gillette, N. J., archt.

▲ **B. J. Lucarelli Co., Inc.,** 1100 McArthur Hy., Newark, N. J., CA Est. **$2,000,000,** 9 story Queen Mary APARTMENT, North Broad St., CA Est. **$2,000,000,** Queen Elizabeth APARTMENT, Cross St., ELIZABETH, N. J. Dewey Albert & Herman Leichtung, 185 Montague St., Brooklyn, N. Y. M. E. Ungarleider, 66 Court St., Brooklyn, N. Y., archt. CD 2/10.

K-T Builders, Inc., 146 Garden Ave., Paramus, N. J., Owner Builds, **$545,000,** 20 HOUSES, Prospect St., GLEN ROCK, N. J. C. J. Kordys, Hamburg Turnpike, Wayne, N. J., archt..

Ray Bares, 9 Jefferson St., Little Ferry, N. J., Owner Builds, **$500,000,** 17 two-family HOUSES, Berrywood Exkel Rd., LITTLE FERRY, N. J.

▲ **New Jersey Post Constr. Co.,** 8150 Union Ave., Pennsauken, N. J., CA **$1,119,400,** INTERMEDIATE SCHOOLS Nos. 2 & 3, MIDDLETOWN, N. J. Bd. Educ. Middletown Twp., Tindall Rd., Middletown, N. J. Bids June 28, CD 7/7, under LB.

Collins & Maxwell, 100 Bushkill Dr., Easton, Pa., CA **$120,000,** CHEMICAL PLANT, Frenchtown Rd., MILFORD, N. J. Riegel, Paper Corp., Frenchtown Rd., Milford, N. J.

A. Kaplan & Son, Ltd., 100 Hugeunot Ave., Englewood, N. J., CA **$541,700,** general contract Proj. NJ 23-2, 56 units HOUSING, MORRISTOWN, N. J. Town Housing Auth., Vail Pl., Morristown, N. J. Bids June 28, awarded Sept. 9. CD 7/1, under LB.

▲ **Padula Constr. Co.,** 81A Mt. Vernon Pl., Newark, N. J., CA Est. **$3,000,000,** APARTMENT, Custer Ave. and Weequahic Park, NEWARK, N. J. Arthur Padula, 81A Mt. Vernon Pl., Newark, N. J. Romolo Bottelli, 1878 Springfield Ave., Maplewood, N. J., archt.

▲ **Johnstowne Bldg. Corp.,** 198 State Hy. 1, New Brunswick, N. J., Owner Builds, **$1,200,000,** 60 HOUSES, off Rte. 18, East Brunswick, NEW BRUNSWICK, N. J. Harsen Johns & Kobayoshi, 60 Westervelt Ave., Tenafly, N. J., archts.

▲ **John Cali,** c/o Stephen Potter, archt., 410 Colonia Ave., Union, N. J., Owner Builds, **$3,000,000,** 104 HOUSES, Princeton Hill, Southgate Rd., NEW PROVIDENCE, N. J.

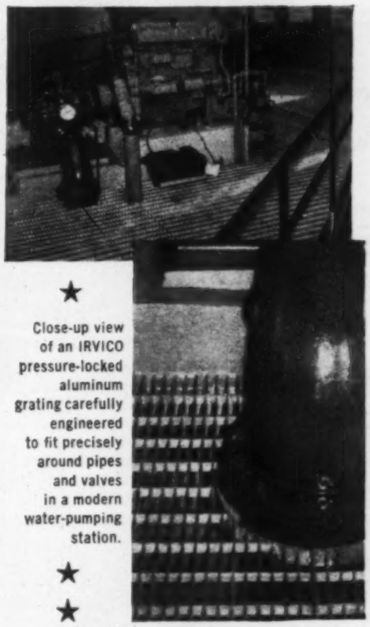
▲ **J. A. LaRocca Bros.,** 63 Zabriski St., Jersey City, N. J., CA **$1,583,000,** two 7-story OLD AGE HOUSING, Ellison, Passaic, Keen and Franklin Sts., PATERSON, N. J. City Housing Auth., Ellison St., Paterson, N. J. CD 7/1, under LB.

▲ **W. J. Happel Jr.,** 589 Central Ave., East Orange, N. J., Owner Builds, **$4,000,000-$5,000,000,** 100 HOUSES South Orange Ave., SHORT HILLS, N. J.

▲ **S. L. Halpern,** 476 E. Main St., Somerville, N. J., Owner Builds, **$1,000,000,** 80 HOUSES, Brooks Blvd., SOMERVILLE, N. J. Tetonic Assocs., 205 W. Main St., Somerville, N. J., archts.

(Continued on page 204)

PRECISION
AND
SKILL



★
Close-up view of an IRVICO pressure-locked aluminum grating carefully engineered to fit precisely around pipes and valves in a modern water-pumping station.
★
★

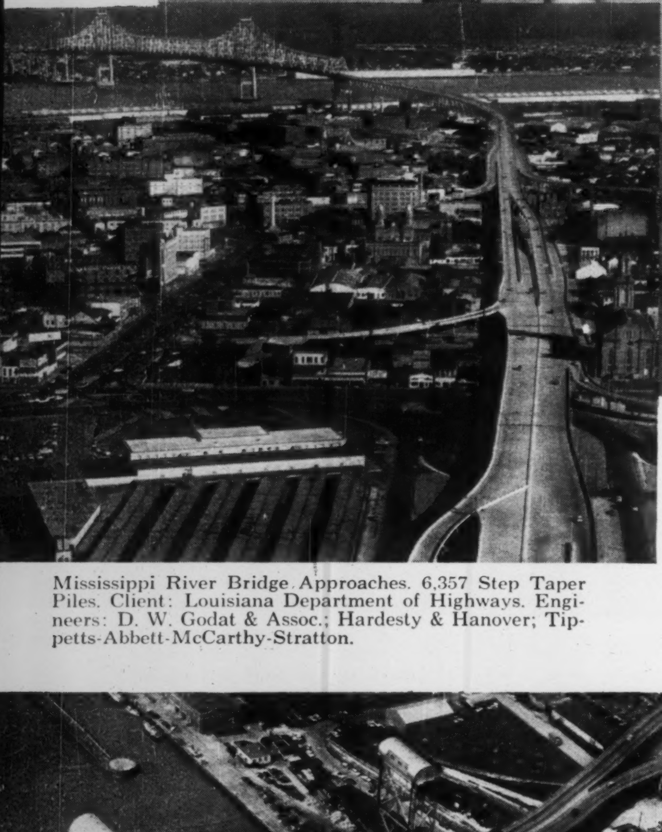
GO INTO
A GOOD
GRATING

When you specify IRVICO grating, you receive the benefit of engineering and manufacturing skill developed during more than 57 years of experience in the production of grating. Each IRVICO order is given careful engineering attention. Experienced shop craftsmen execute your order with finesse, and our inspectors permit no grating to be shipped unless it meets your specifications and our high standards. This insures high quality grating, an excellent fit, and no extra installation costs. Catalog on request

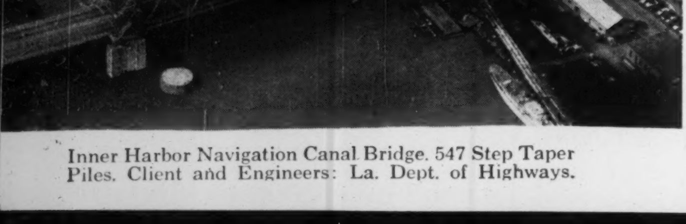
IRVICO
IRVING SUBWAY GRATING CO., Inc.
Originators of The Grating Industry Est. 1902
Offices and Plants at:
5063 27th St., LONG ISLAND CITY 1, N.Y.,
1863 10th St., OAKLAND 20, CALIFORNIA

CIRCLE 201 ON READER SERVICE CARD

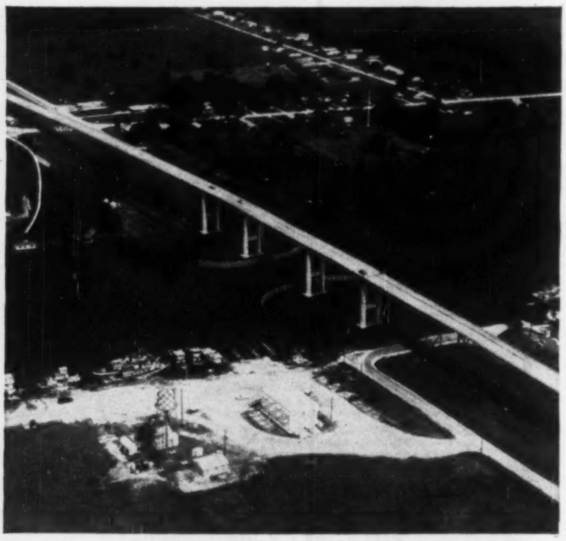
Pas Manchac Bridge. 111 Prestressed Cylinder Piles. Client and Engineers: the Louisiana Department of Highways.



Mississippi River Bridge Approaches. 6,357 Step Taper Piles. Client: Louisiana Department of Highways. Engineers: D. W. Godat & Assoc.; Hardesty & Hanover; Tippetts-Abbett-McCarthy-Stratton.

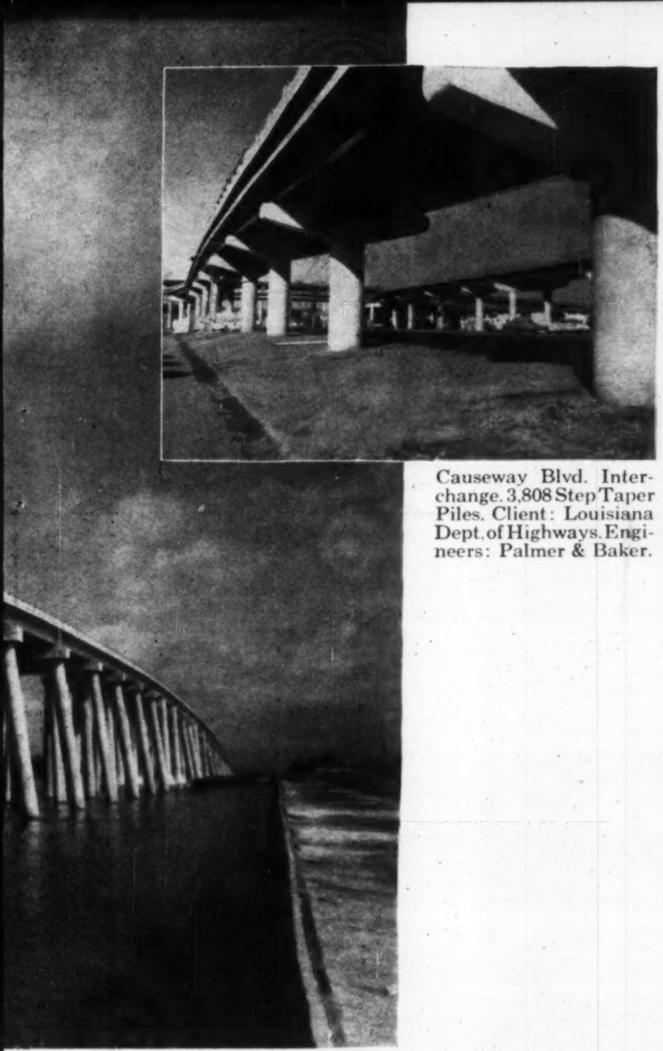


Inner Harbor Navigation Canal Bridge. 547 Step Taper Piles. Client and Engineers: La. Dept. of Highways.



Bayou Boeff Bridge. 491 Step Taper Piles. Client and Engineers: Louisiana Department of Highways.

Bridge Design Engineer (except for Pontchartrain Causeway), J. B. Carter, now Assistant Chief Engineer for the Department.

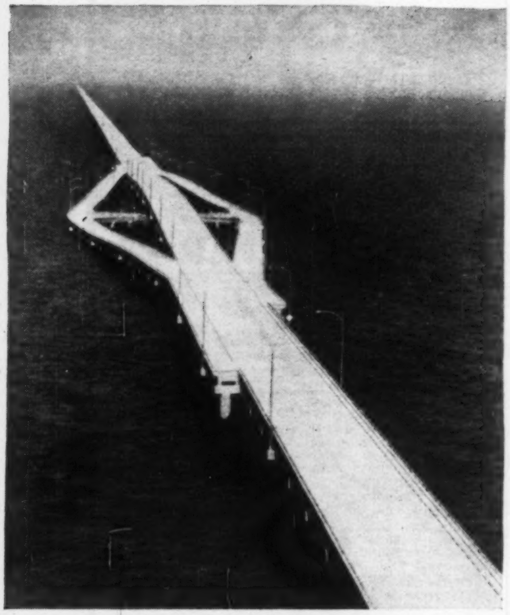


Causeway Blvd. Interchange. 3,808 Step Taper Piles. Client: Louisiana Dept. of Highways. Engineers: Palmer & Baker.

Look what RAYMOND has been doing in Louisiana!

30 highway and bridge projects in the past 10 years

For a look at progressive highway planning, take a tour of Louisiana. New bridges, causeways, overpasses, interchanges and superhighways are helping make the Creole state a delight to visit—and to live in. As in many other areas, Raymond has worked closely with the various highway agencies in handling the wide variety of foundation problems that are always present. Some have been solved more or less routinely through the application of our knowledge and experience. Others have been more difficult and have called for creative ingenuity. But all have been handled with the thoroughness and capabilities of the company that has been the leader in the field for over half a century. If you're contemplating construction in your state, whether large or small, contact your nearest Raymond office and let us show you what we mean.



Lake Pontchartrain Causeway. 4,886 Prestressed Cylinder Piles. Client: Greater New Orleans Expressway Comm.; Engineers: Palmer & Baker.

CONCRETE PILE DIVISION
RAYMOND
INTERNATIONAL INC.
140 CEDAR ST., NEW YORK 6, NEW YORK

Branch Offices in principal cities of the United States. Subsidiaries in Canada, Central and South America and other countries around the world.

FOUNDATIONS AND SPECIALIZED CONSTRUCTION IN AMERICA
COMPLETE CONSTRUCTION SERVICES ABROAD

CIRCLE 203 ON READER SERVICE CARD

NO PLACE TO GAMBLE

Joints on steel plant water line are TAPECOATED to provide protection equivalent to coating on the pipe.

TAPECOAT®
is Your Best Bet to Protect Lines in Underground Service

You take no chances when you specify TAPECOAT coal tar coating in handy tape form for pipe, pipe joints, fittings, couplings, tanks, tie rods, and conduit on new construction or for maintenance.

Since 1941, TAPECOAT has proved its superiority in resisting moisture, acids, alkalis, and other severe corrosive and abrasive conditions.

TAPECOAT comes in rolls of 2", 3", 4", 6", 18" and 24" widths. It is easy to apply with the use of a torch to bleed the coating which serves as both bond and protection. No skilled help required.

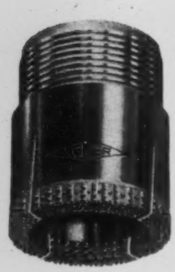
A TAPECOAT sales and service engineer is ready to help you on any corrosion problem. Write for details today.

Originators of Coal Tar Coating in Tape Form

The **TAPECOAT** *Company* *1551 Lyons Street, Evanston, Ill.*
Representatives in Principal Cities
Manufactured and distributed in Canada by The Tapecoat Company of Canada, Ltd.
25 Haas Road, Rexdale, Ontario

CIRCLE 41 ON READER SERVICE CARD

ANNOUNCING
ACKER DIAMOND BITS
AN ALL-NEW QUALITY LINE



Now, a quality line of moderately priced diamond bits takes its place in the distinguished Acker line of drilling equipment.

Acker manufactures and stocks a variety of diamond bits including a complete line of thin-wall diamond bits.

Acker diamond bits will do the most exacting job better and more economically. They're expertly designed and crafted of the finest materials and workmanship in Acker's new, ultra-modern plant. Complete inspection and quality control plus Acker's impeccable reputation for reliability and dependability are your guarantee of satisfaction. Try an Acker bit on your next job, you'll be pleased with its rugged construction and ability to stand-up under the most severe conditions.

FREE
Write today for free 28 page diamond bit and core barrel Bulletin 10 ENR

ACKER DRILL CO., INC.
P. O. Box 830
Scranton 2, Pa.

Manufacturers of a complete line of: Soil Sampling Tools • Rotary Earth Augers • Diamond & Shot Core Drills • Earth Boring Equipment • Diamond Bits • Drilling Accessories & Supplies

(Continued from page 201)

McCoy Bros., Inc., Holly Springs, Pa., CA **$236,900,** general contract PLANT addn., CARLISLE, PA. Carlisle Tire & Rubber Division, Carlisle Corp., Carlisle, Pa. Burchart Assocs., 611 W. Market St., York, Pa., archts. CD 1/21.

Edward M. Happ, Ashland and Washington Sts., Doylestown, Pa., CA Over **$110,000,** 1 story 32,200 sq. ft. FACTORY addn., DOYLESTOWN, PA. Mohawk Devices, Doylestown, Pa.

Warren J. Flail & Sons, Wayne, Pa., Separate Contracts, **$400,000,** RESIDENTIAL DEVELOPMENT, Newtown Rd., etc., ITHAN, PA.

Chris Gigliotti, 9140 Verree Rd., Phila., Pa., Separate Contracts, Over **$400,000,** RESIDENTIAL DEVELOPMENT, Rambler Dr., etc., PHILA., PA. Zell Bender, 225 N. 6th St., Camden, N. J., archt.

Carco Industries, Inc., 7341 Tulip St., Phila., Pa., Separate Contracts, **$200,000,** PLANT addn., alterations, PHILA., PA.

CMC Constr. Co., Inc., 1719 Chestnut St., Phila., Pa., Separate Contracts, **$400,000,** RESIDENTIAL DEVELOPMENT, Draper St., etc., PHILA., Pa. Berg & Rudy, 1411 Walnut St., Phila., Pa., archts.

Lauter Constr. Co., 112 S. 16th St., Phila., Pa., CA Over **$110,000,** WAREHOUSE addn., PHILA., PA. Container Corp. of America, 38 S. Dearborn St., Chicago, Ill., Pace Assocs., 53 W. Jackson Blvd., Chicago, Ill., archts.

Lardner & Wich, Inc., 915 Sterrett St., Baltimore 30, Md., CA **$550,000,** brick, block concrete, SCHOOL and CONVENT, BALTIMORE, MD. St. Brigid Parish, 3109 Hudson St., Baltimore, Md. Edw. H. Glidden Jr., 107 E. 25 St., Baltimore 18, Md., archt.

▲ **George Hyman Constr. Co.,** 1010 Vermont Ave., N.W., Wash., D. C., LB **$1,349,000,** (10 bidders), HEADQUARTERS BLDG., 1621 Massachusetts Ave. N.W., Wash., D. C. National Lumber Manufacturing Assn., 1319-18th St. N.W., Wash., D. C. CD 8/12.

Heritage Farms, c/o Frank A. Robino Inc., 2610 Capitol Trl., Marshallton, Del., Separate Contract Over **$400,000.** RESIDENTIAL DEVELOPMENT, MARSHALLTON, DEL.

▲ **Cantera Constr. Co.,** 1508 Pennsylvania Ave., Wilmington, Del., Owner Builds, **$1,000,000,** 2 story, 30,000 sq. ft. OFFICE, 8 and Wests Sts., WILMINGTON, DEL. Delaware State Compensation Comr., lessee, W. Ellis Preston, 903 Jefferson St., Wilmington, Del., archt.

SOUTH

HEAVY CONSTRUCTION—BA

† **Fla., Cocoa**—CALIBRATION BLDG. ADDN.—BA About 9/29—U. S. Eng., P.O. Box 4970, Jacksonville, 1 story, concrete frame, concrete block, 3267 sq. ft. addn. to G/M Laboratory Calibration Bldg., sidewalk and parking area, Cape Canaveral Missile Test Center; Patrick Air Force Base, ENG-08-123-61-22, $75,000. CD 6/4/59.

† **Ga., Macon**—BA 9/29—REROOFING—Dist. P. Wks. Office, Building No. 13, U. S. Naval Base, Charleston, S. C., reroofing U. S. Naval Ordnance Plant, NBy-34539, Spec. 34539/60. $25,000-$100,000. CD 4/15/53.

† **Tennessee**—ROADS—BA 9/29—Bur. Public Roads, Dpt. Commerce, First National Bank Bldg., Florence, Ala., Proj. 1F5-106, double bituminous surface treatment and other work from highway US 64, 16,674 mi. to near Tenn. Hy. 20, **Natchez Trace Parkway.** CD 9/22/59.

Tenn., Dayton—BA 10/3—City, City Hall, sewage collection system imprvs. $100,000. Plans deposit $35. two sets. Albert Switzer, Associate, Box 4386, Jackson, Miss., engrs. CD 12/9.

† **Fla., Cocoa**—OPERATIONS SUPPORT BLDG.—BA 10/4—U. S. Eng., P. O. Box 4970, Jacksonville, Tenn., operations support bldg., Complex 34, Patrick Air Force Base, ENG-08-123-61-21, $700,000. Plans deposit $10. CD 9/7.

▲ **Va., Langley Field**—HIGH TEMPERATURE STRUCTURE TUNNEL—BA 10/5—Contracting Officer, National Aeronautics and Space Admin., Langley Air Force Base, 8 ft. high temperature structure tunnel, NASA Spec. L-1140, IFB L-1140, $1,500,000. CD 8/16.

▲† **Florida**—BA About 10/6—U. S. Eng., P. O. Box 4970, Jacksonville, Levees 50 and 61, Central and Southern Florida, Flood Control Proj., near northwest shore of Lake Okeechobee, East Glades Co., near Lakeport, ENG-08-123-61-15, $1,500,000. CD 9/29/59.

La., Bernice—BA 10/6—Town of Bernice, Union Parish, **(A)** sewage collection sys. **(B)** oxidation pond. Plans deposit $25. J. S. Boyd & Assocs., 2026 DeSoto St., Shreveport, consult. engrs. CD 9/17/59.

▲ **Ky., Covington**—BA 10/8—Sanitation Dist. No. 1, 212 Greenup St., 18 x 24 in. sanitary trunk sewer to connect sys. at Crestview, Edgewood, Erlanger; connecting line to Boone County Industrial Park. $1,140,000. O. G. Loomis & Assocs., 542 Greenup, engrs. CD 3/16.

† **Louisiana**—BA 10/12—U. S. Eng., foot of Prytania St., New Orleans, Inner Harbor Navigation Canal Lock, constr. fender sys. and mooring clusters, New Orleans, CIVENG-16-047-61-32. $100,000. Plans deposit $1.

Georgia—TELEPHONE LINES—BA 10/14—Gold Leaf Telephone Co., Moultrie, telephone lines, Lanier, Cook, Lowndes, Brooks and Berrien Counties, $200,000. Plans deposit $20. Engineering Associates, 171 W. Peachtree Place NW, Atlanta, engrs.

(Continued on page 206)

DELMAG

LOW-COST OPERATION

DIESEL PILE HAMMERS

DELMAG Diesel Pile Hammers are light in weight yet develop tremendous energy per blow and have proven outstandingly successful under all weather conditions.

Requiring no costly "extras," DELMAG Diesel Pile Hammers are completely self-contained and weigh approximately one-half that of steam hammers of comparable energy rating. This results in a big saving on the size of handling equipment required and makes for a much more mobile pile driving operation.

SALES AND SERVICE
From Coast to Coast

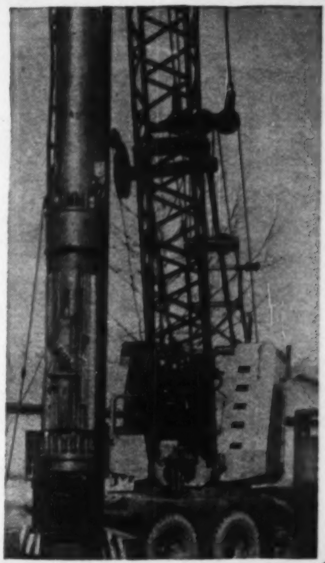
Illustrated literature sent on request

THREE MODELS AVAILABLE:

D-5
9,100 ft. lbs.

D-12
22,500 ft. lbs.

D-22
39,700 ft. lbs.



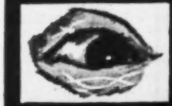
The Foundation Equipment Corp.,
100 Elizabeth St., Newcomerstown, Ohio

Martz Machinery Co.,
988 Market St., San Francisco 2, Calif.

Andrews Machinery of Washington Inc.,
3633 East Marginal Way, Seattle 4, Wash.

Special Construction Machines, Ltd.,
166 Bentworth Ave., Toronto 19, Ont.

CIRCLE 43 ON READER SERVICE CARD



SEE a demonstration by a specialist

CONCRETE FLOOR TREATMENT

Saves · TIME
· MATERIAL
· LABOR

ONE PRODUCT
ONE APPLICATION
4-WAY PROTECTION

Flick-Reedy Plant, Bensenville, Illinois

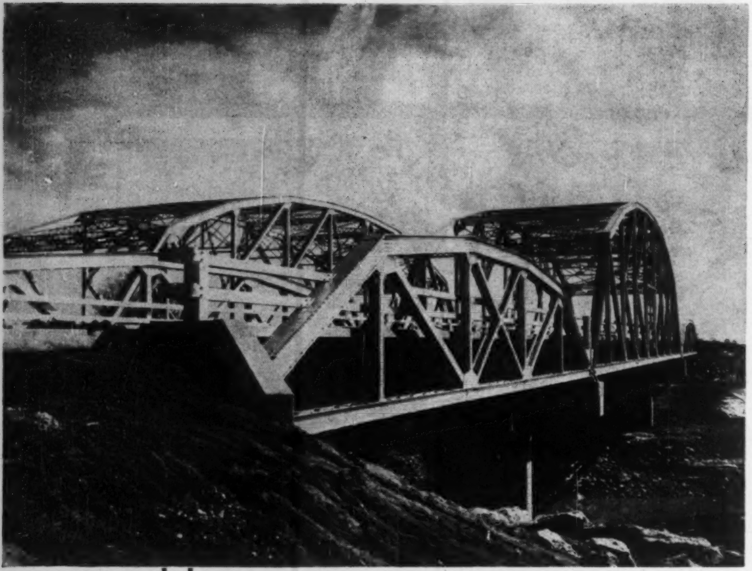
- 1—CURES
- 2—HARDENS
- 3—SEALS
- 4—DUSTPROOFS

WEST CONCRETE FLOOR TREATMENT is a quick drying formulation. Even spreading. Easily applied by unskilled labor. It enables newly-laid wet concrete to retain 95% of its moisture. This permits curing and hardening while sealing and dustproofing the surface. Meets ASTM Specification C-309.

for FREE demonstration or literature address:
WEST CHEMICAL PRODUCTS INC., 42-45 West St., Long Island City 1, N. Y.
Branches in principal cities • IN CANADA: 5621-23 Casgrain Ave., Montreal

WEST CHEMICAL PRODUCTS INC.

CIRCLE 205 ON READER SERVICE CARD



A truss type bridge all connections shop and field riveted span lengths, 100′—210′—100′ clear span.

FABRICATED STRUCTURAL and reinforcing STEEL for BRIDGES and Highways

Plate Girder Bridge all connections shop and field welded span lengths 54′—108′—54′.

You can bid right when the structural steel is fabricated by Flint, it just works up faster and cleaner.

Flint has over 360,000 sq. ft. of steel fabricating and storage areas. Close tolerances and tight schedules are met with ease.

for STEEL call FLINT

FLINT STEEL

P. O. Box 1289 • LU 4-3621
Tulsa 1, Oklahoma
Memphis, Tenn.

AISC

You Can Depend on FLINT!

(Continued from page 204)

▲† **Alabama-Georgia**—BA 11/2—U. S. Eng., 2301 Grant St., Mobile, Ala., powerhouse, Stage 11 and non-overflow dike, Chattahoochee River, Walter F. George Dam project, Ft. Gaines, Ga., ENG-01-176-61-12. $6,000,000. CD 9/19/58.

BUILDINGS—BA

† **Va., Norfolk**—BA 9/27—TAXIWAY REPLACEMENT—Dist. P. Wks. Office, Fifth Naval Dist., Room 307, Bldg. N-26, U. S. Naval Base, Norfolk, replacement of SP-Area Taxiway, Naval Air Station, Contr. NBy-33743, Spec. No. 33743/60. $250,000-$500,000.

N. C., Wilson—PLANT—BA 9/28—Imperial Tobacco Co., Ltd., of Great Britain, 422 E. Franklin St., Richmond, 220,000 sq. ft. tobacco redrying plant. Over $750,000. Plans deposit $100. E. Tucker Carlton, 206 E. Cary St., Richmond, Va., archt. CD 5/31.

Fla., Miami—BANK-OFFICE—BA 9/29—Central Bank & Trust Co., 1310 NW 36th St., bank-office. $800,000. CD 6/6.

Ky., Owensboro — EDUCATIONAL — BA 9/29 — First Baptist Church, 3rd and Lewis Sts., 3 story, no bsmnt. Religious Educational Bldg., $550,000. Plans deposit $50. Clifton J. Marshall, Union Sta. Bldg., archt. Engineering Services, Rte. 2, Hopkinsville, mechanical engrs. CD 7/14/59.

† **Fla., Miami**—POST OFFICE—BA 10/3—U. S. Post Office Dpt., 428 Federal Annex, Atlanta 3, Ga., build and lease Post Office, SW Corner NW 2nd Ave. and 187th St., (Norland Branch).

† **Fla., Miami**—POST OFFICE—BA 10/3—U. S. Post Office Dpt., 428 Federal Annex, Atlanta 3, Ga., build and lease Post Office, NE 188th Terrace and W. Dixie Hy., (Ojus Branch).

▲ **S. C., Charleston**—PLANT—BA 10/4—S. C. State Ports Authority, general cargo area and cold storage plant. Plans deposit $50. Lockwood Greene Engineers, Inc., Spartanburg, engr. CD 4/22.

† **Ala., Sheffield**—SMOKE STACK REPLACEMENT—BA 10/5—District P. Wks. Office, Sixth Naval Dist., Bldg. No. 13, U. S. Naval Base, Charleston, S. C., replacement smoke stack, U. S. Naval Reserve Training Center, NBy-31384, Spec. 31384/60/REV. Bids June 24 rejected. CD 6/8.

▲† **Tenn., Oak Ridge**—PLANT—BA About 10/11—Atomic Energy Comn., 1 story, 20,000 sq. ft. Development Laboratory, K-1006 Bldg. in Oak Ridge Gaseous Diffusion Plant Area of United States Atomic Energy Comn., Roane County. Plans deposit $50. CD 9/12/58.

BUILDINGS—SLC

Ala., Decatur—WAREHOUSE, OFFICE—The Noland Co., 305 Lee St., NE, soon lets contract, warehouse-office, $150,000. CD 8/15.

Fla., Tampa—APARTMENT—University Apt., Inc., c/o Robert Wielage, archt., 1303 C. S. Dale Mabry, Tampa, soon lets contract, University Apartment Bldg., Fletcher Ave., at entrance of University of S. Florida, $480,000.

N. C., Charlotte—TERMINAL—Observer Transportation Co., 600 S. Tryon St., soon lets contract, 29,000 sq. ft. motor freight terminal. $150,000. Plans deposit $75. Chas. W. Connelly, 1201 Elizabeth Ave., archt. CD 1/27.

N. C., Charlotte—WAREHOUSE-OFFICE—Seaboard Airline Railway Co., 3600 W. Broad St., Richmond, Va., soon lets contract, warehouse-office, Washburn St. $200,000. CD 8/18.

N. C., Durham—MANUFACTURING PLANT—Didco Park, c/o John D. Latimer, archt., Snow Bldg., Durham, soon lets contract, manufacturing plant, $200,000. CD 8/29.

N. C., Durham—BUILDING—Duke University, Administration Bldg., soon lets contract, 6 story Gerontology and clinical research building, Over $500,000. Horace Trumbauer, William O. Frank & William E. Frank, Land Title Bldg., Phila., Pa., archts. CD 8/19.

HEAVY CONSTRUCTION—LB & CA

VIRGINIA—State Dpt. Hys., 1221 E. Broad St., Richmond,

Troitino Bros. Inc., P. O. Box 1270, Beckley, W. VA., CA **$547,395**, 5 bridges, Interstate 66, Contr. 3, Proj. 0066-029-102, B-602, B-613, B-614, B-615, B-620, Fairfax Co. Bids Aug. 31. CD 9/9, under LB.

VIRGINIA—State Dpt. Hys., 1221 E. Broad St., Richmond,

Elvin C. Riggleman, P. O. Box 547, Moorfield, W. Va., CA **$777,427**, b. conc. pavement, bit. top, bridge, 2.952 mi. Rte. 50, Proj. 0050-034-101, C-501, B-602, Frederick Co., Bids Aug. 31, CD 9/9, under LB.

Myers & Quigg, 91 O St., S. E. Wash. 3, D. C., LB **$393,346**, est $332,000, (3 biders) runway, taxiway, parking apron, rein.-con. paving, NEWPORT NEWS, VA. Patrick Henry Airport Comn. Capitol Airlines Inc., Newport News, Va. CD 8/30.

Thompson-Arthur Co., 300 S. Benbow Rd., Greensboro, N. C., CA **$156,257** street imprvs., HIGH POINT, N. C. City, City Hall, High Point, N. C., Bids Aug. 31.

City of Shelby, City Hall, Shelby, N. C., rejected bids Aug. 18, WW imprvs., SHELBY, N. C., Over **$75,000**.

J. S. Hill Constr. Co., P. O. Box 112, Washington, N. C., LB **$87,349**, street paving, WASHINGTON, N. C., City, City Hall, Washington, N. C.

▲ **SOUTH CAROLINA**—State Hy. Dpt., Hotel Wade Hampton, Columbia, Bids opened 7/19,

Robert E. Lee & Co., Inc., P. O. Box 417, Maining, S. C., CA **$1,579,317**, (5 bidders), grading, 4 and

6 lane divided hy., 7.049 mi. Inter. 26, US 78 to Remount Rd. with connection from US 52 to Inter. 26, S. C. Dockets 10.471 and 10.472, FAP Nos. I-26-4(14), and F-153, (4), Charleston Co. CD 7/27.

▲† **Asheville Constr. Co.**, P. O. Box 5191, Biltmore Station, Asheville, N. C., LB **$1,162,363**, relocate S. C. State Rd. 37 and C. & N. W. Ry. bridge, Hart Co. Ga., and Anderson, Pickens and Oconee Counties, S. C.; Hartwell Dam Proj., Savannah River, ENG-09-133-61-1, SOUTH CAROLINA and GEORGIA. U. S. Eng., 200 E. St. Julian St., Savannah, Ga. Bids Sept. 7. CD 8/23.

▲ **Crosland-Roof Constr. Co.**, P. O. Box 1313, Columbia, S. C., CA **$1,229,701**, Union Pier and Transit Shed, CHARLESTON, S. C. S. C. State Ports Authority, foot of Market St., Charleston, S. C. CD 9/7.

Boyle Constr. Co., P. O. Box 471, Sumter, S. C., CA **$79,696**, water lines, SUMMERVILLE, S. C. City, City Hall, Summerville, S. C. CD 8/31.

† **Sam A. Sloane**, Rte. 1, P. O. Box 318, Charleston, S. C., LB **$171,445**, modifications to C. & N. W. Ry. bridge over 26 Mile Creek, Hart Co., Ga., and Anderson Co., S. C., Hartwell Dam Proj., Savannah River, ENG-09-133-60-45, GEORGIA and SOUTH CAROLINA. U. S. Eng., 200 E. St. Julian St., Savannah, Ga. Bids Sept. 8. CD 8/23.

Georgia Power Co., 52 Fairlie St. N. W., Atlanta, Ga., Day Labor, **$112,000**, electrical sub-station addn., 1118 Spring St. N. W., ATLANTA, GA.

Richmond County and City of Augusta, City Hall, Augusta, Ga., rejected bids Sept. 1, sanitary sewers, Rae's Creek area, AUGUSTA, GA. **$200,000**. CD 8/22.

Arthur Pew Constr. Co., 5007 Peachtree Rd., Chamblee, Ga., LB **$84,867**, WW imprvs., Contract B (water lines) EATONTON, GA., City, City Hall, Eatonton, Ga.

Watson-Yeargan Co., P. O. Box 117, Jesup, Ga. LB **$175,000**, park imprvs., 2 swimming pools, dressing rooms, JESUP, GA, Wayne-Jesup Recreation Comn., Odum Highway, Jesup, Ga Bids Sept. 1 CD 8/22.

▲ **Duval Engineering & Constr. Co.**, 1746 E Adams, Jacksonville, Fla., LB **$2,435,568**, est. $2,800,000, (6 bidders), toll road to Savannah Beach, SAVANNAH, GA., Bd. Comrs. Chatham Co., Courthouse, Savannah, Ga. CD 7/29.

Sam Finley, Inc., P. O. Box 1789, Savannah, Ga., LB **$147,855**, paving Bloomingdale Rd between U. S. 80 and Pine Barrow Rd.; LB **$90,747**, paving Pooler Cross Road between Hy. 80 and Rine Rd. Barrow, SAVANNAH, GA., Bd. Comrs. Chatham Co., Courthouse, Savannah. Bids Sept. 7. CD 8/23.

▲† **James P. Cross Constr. Co.**, P. O. Box 287, New Iberia, La., CA **$2,128,950**, Sec. 2, Structures 68, 82 and 83, Canal 41-A, Highlands Co., ENG-08-123-61-2, FLORIDA. U. S. Eng., P. O. Box 4970, Jacksonville, Fla., Bids Aug. 15, CD 8/24, under LB.

Walter Lalley, Inc., 205 Worth Ave., Palm Beach, Fla., LB **$440,000**, water treatment plant, DEERFIELD BEACH, FLA., City, City Hall, Deerfield Beach, Fla. CD 8/30;
Crom Corp., 212 SE 1st St., Gainesville, Fla., LB **$54,935**, underground storage reservoir (pre-cast concrete) (Deerfield Beach, Fla.)

City of Fernandina Beach, City Hall, Fernandina Beach, Fla., Day Labor, **$100,000**, street paving, FERNANDINA BEACH, FLA.

Benton & Co., Inc., 870 3rd St., S., St., Petersburg, Fla., LB **$124,110**, hydraulic fill for N/S Runway extension St. Petersburg-Clearwater International Airport, ST. PETERSBURG, FLA. Comrs. Pinellas Co. 305 Haven St., Clearwater, Fla. CD 12/17.

Cambron Constr. Co., P. O. Box 8515, Orlando, Fla., LB **$246,463**, Contr. A, WW imprvs., water mains, ST. PETERSBURG, FLA. Bd Comns. Pinellas Co. 305 Haven St., Clearwater, Fla.

Boyce Co., P. O. Box 5341, Birmingham, Ala., LB **$124,400**, Contr. B, WW imprvs., subaqueous crossing, (St. Petersburg, Fla.) CD 8/29.

Alpine Constr. Co., P. O. Box 5965, Homewood, Ala., LB **$335,476**, sewage treatment plant, ATMORE, ALA. City, City Hall, Atmore, Ala. Bids Sept. 1, CD 8/5.

Brice Bldg. Co., Inc., 1021-2nd Ave., N., Birmingham, Ala., CA **$116,777**, passenger subway at L. & N. R. R. station Morris Ave and 19th St. BIRMINGHAM, ALA., City, City Hall, Birmingham, Ala CD 9/7, under LB.

Donahoo-Rast Contg. Co., 1013 3rd Ave. S., Birmingham, Ala., LB **$219,285**, sanitary sewer imprvs., HUNTSVILLE, ALA. City, City Hall, Huntsvile, Ala Bids Sept. 8.

Meador Contg. Co., 1807 Old Shell Rd., Mobile, Ala. LB **$174,000**, WW imprvs., Contracts B & C (water lines, etc.) JACKSON, ALA., City, City Hall, Jackson, Ala., CD 8/26;

T. & H. Constr. Co., Red Level, Ala., LB **$85,000**, WW imprvs., contract A (water storage facilities) (Jackson, Ala.),

▲ **Steel City Constr. Co.**, P. O. Box 5965, Birmingham, Ala., LB **$1,043,000**, water treatment plant, PRICHARD, ALA., City, City Hall, Prichard, Ala. Bids Sept. 1, CD 8/12.

LOUISIANA—State Dpt. Hys., Rm. 426, Headquarters Admin. Bldg., Baton Rouge,

L. H. Bossier, Inc., 907 4 St., Alexandria, La., CA **$942,051**, Boyce-Lena overpass Hy. Rte. LA1, SP 53-02-11 FASP S-334(2), Rapides Parish. Bids Aug. 24, awarded Sept. 2. CD 8/30, under LB.

† **Wm. M. Cowgur & Co., Inc.**, 721 Olive St., New Orleans, La. LB **$80,586**, est. $100,000, (6 bidders), approx. 7375 lin. ft. foreshore protection, right

Applying Jennite J-16 on New York Thruway bridge deck.

Jennite J·16

Jennite J·16® protects

"Main Line of the Empire State"

Solves major maintenance problem for New York Thruway Authority

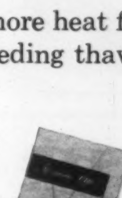
There are over 470 bridges on the New York Thruway's 533 miles of super highway. Since bridge decks always freeze before highway pavements, vast quantities of de-icing salts must be employed to keep these safe for motorists.

. . . and Jennite J-16, with special abrasive grit, is used to protect concrete bridge surfaces against water and salt penetration . . . other damage incident to freezing and thawing.

In addition, Jennited surfaces absorb more heat from the sun than uncoated areas, thereby speeding thawing action.

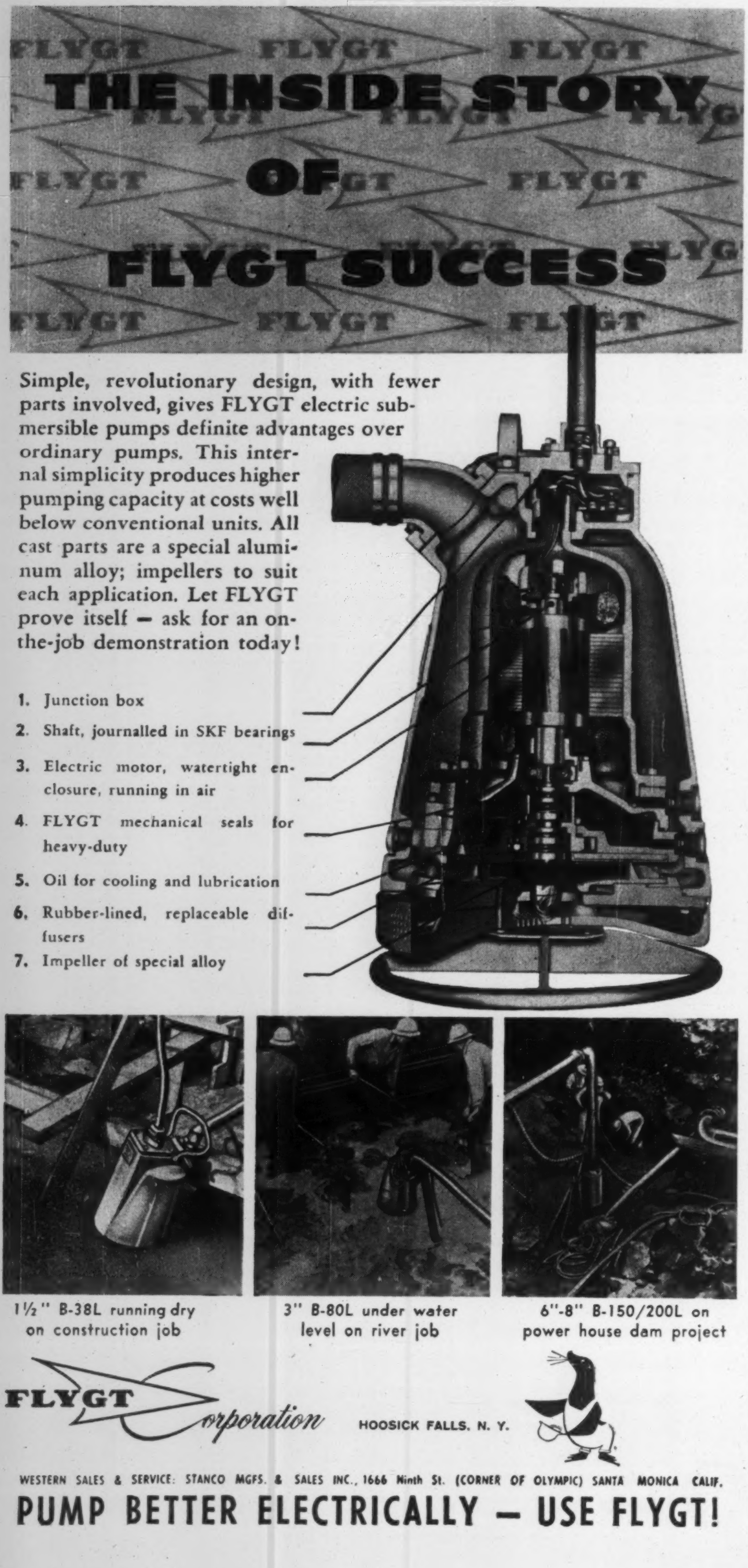
Find us fast in the 'Yellow Pages'

For complete information about Jennite J-16, Write for Bulletin M-2992. Also, see our catalog in Sweets.



MAINTENANCE INC. WOOSTER · OHIO

Distributors and stocks in principal cities.



THE INSIDE STORY OF FLYGT SUCCESS

Simple, revolutionary design, with fewer parts involved, gives FLYGT electric submersible pumps definite advantages over ordinary pumps. This internal simplicity produces higher pumping capacity at costs well below conventional units. All cast parts are a special aluminum alloy; impellers to suit each application. Let FLYGT prove itself — ask for an on-the-job demonstration today!

1. Junction box
2. Shaft, journalled in SKF bearings
3. Electric motor, watertight enclosure, running in air
4. FLYGT mechanical seals for heavy-duty
5. Oil for cooling and lubrication
6. Rubber-lined, replaceable diffusers
7. Impeller of special alloy

1½" B-38L running dry on construction job

3" B-80L under water level on river job

6"-8" B-150/200L on power house dam project

FLYGT Corporation HOOSICK FALLS, N. Y.

WESTERN SALES & SERVICE: STANCO MGFS. & SALES INC., 1666 Ninth St. (CORNER OF OLYMPIC) SANTA MONICA CALIF.

PUMP BETTER ELECTRICALLY — USE FLYGT!

descending bank of Mississippi River, CIVENG-16-047-61-18, LOUISIANA. U. S. Eng., foot of Prytania St., New Orleans, La. Bids Sept. 8. CD 8/24.

Boh Bros. Constr. Co., 2400 Cypress St., New Orleans, La., LB **$75,795,** (4 bidders), Contr. 454-W c.i. water mains and vitri. clay sewers, NEW ORLEANS, LA. New Orleans Sewerage & Water Bd., City Hall, New Orleans, La. Bids Sept. 7. CD 8/30;
Manson, Smith, McMaster, Inc., 321 Fredricks Rd., Gretna, La., LB **$71,668,** (8 bidders), Contr. 421-S, c.i. water main and vitri. clay sewers (New Orleans, La.).

Kelly-Generes Constr. Co., Box 8067, New Orleans, La., LB **$429,002,** (8 bidders), Contr. D-269, covered rein.-con. drainage canal, NEW ORLEANS, LA. Sewerage & Water Bd., City Hall, New Orleans, La. Bids Sept. 7, CD 8/30;
Oliver Meyer & Sons, 1115 Poland Ave., New Orleans, La., LB **$119,015,** (9 bidders), concrete, LB **$135,-912,** c.i., LB **$120,820** asbestos, Contr. 412-S furnish install pipe for sewer force main (New Orleans, La.);
Pratt Farnsworth, Inc., Box 372, New Orleans, La., LB **$228,805** concrete, LB **$299,975** steel, (5 bidders), Contr. 408-S, installing rein.-con. pipe (New Orleans, La.).

▲ **KENTUCKY**—Commonwealth of Ky., Dpt. Hys., Frankfort,

Ky.—**Lovell & Hart, Inc.,** 1429 New Circle, Lexington, Ky., CA **$607,544,** b. conc. surf. Class I, 1.33 mi. Leestown Rd. F 326(23) U-UG 538(18), Fayette Co., Awarded Sept. 6;

Ky.—**R. B. Tyler,** 1446 Levering St., Louisville, Ky., CA **$550,109,** b. conc. Class I surf. 16.944 mi. Newport-Maysville. S 198(12), Pendleton and Bracken Counties. Bids Aug. 26, awarded Sept. 2. CD 8/30 under LB.

KENTUCKY—Commonwealth of Ky., Dpt. Hys., Frankfort, Bids opened 9/9,

Ky.—**Kik Constr. Co.,** Box 214, Benton, Ky., LB **$290,671,** (7 bidders), c. conc. 0.767 mi. Columbia Ave. in Glasgow. U 543(3), Barren Co.;

Ky.—**Codell Constr. Co.,** Codell Bldg., Winchester, Ky., LB **$342,213,** (5 bidders), b. conc. Class I, 0.801 mi. Euchlid Ave. in Lexington, US 272(3), Fayette Co.;

Ky.—**Ohio Valley Paving Corp.,** 823 Prospect St., Portsmouth, O., LB **$139,410,** (4 bidders), b. conc. surf. Class I, 6.582 mi. Walnut Grove Rd. S 566 (2), Gallatin Co.;

Ky.—**Winston Ford Co.,** 504 Riverside, Prestonsburg, Ky., LB **$88,346,** (11 bidders), traffic bound surf. 1.408 mi. Denniston-Scranton. RS 83-116, Menifee Co.;

Ky.—**Mago Constr. Co., Inc.,** Box 532, Bardstown, Ky., LB **$113,466,** (2 bidders), b. conc. surf. Class I, 4.79 mi. Andyville-Wolf Creek. SP 82-743, Meade Co. CD 8/25.

KENTUCKY—Commonwealth of Ky., Dpt. Hys., Frankfort, Bids opened 9/9,

Saltsman Constr. Co., Box 482, Bardstown, Ky., LB **$469,014,** (3 bidders), bridge and approaches 0.201 mi. Beattyville-Jackson. S 77 (1), Lee Co. CD 8/25.

Wilson & Trainor Constr. Co., 42½ 11 St., Huntington, W. Va. LB **$142,213,** water treatment plant addns., COLUMBIA, KY. City, City Hall, Columbia, Ky. Bids Sept. 8. CD 8/16.

▲† **Tennessee Valley Authority,** 410 Union Ave., Knoxville, Tenn., Own Forces, **$3,000,000,** repairs to Hales Bar Dam, Hamilton Co., TENNESSEE. CD 6/28/45.

† **W. K. Ingram Co.,** West Memphis, Ark., CA **$61,588.** imprv. channel within flood plain, Thompson Creek and tributaries, Thompson Creek Watershed Proj., Weekly and Henry Counties, TENNESSEE. Thompson Creek Watershed Dist. Contracting Officer, Rm 39, Courthouse Bldg, Dresden, Tenn.

Tipton Constr. Co., Cedar Valley Rd., Bristol, Tenn., LB **$177,115,** storm sewers, BRISTOL, TENN. City of Bristol, City Hall, Bristol, Tenn. CD 8/23.

C. F. W. Constr. Co., P. O. Box 915, Fayetteville, Tenn., LB **$57,175,** WW imprvs., Proj. 349, COLUMBIA, TENN. City of Columbia, City Hall, Columbia, Tenn. CD 11/29/51.

BUILDINGS—LB & CA

Reid, Inc., 711 N. Fayet St., Alexandria, Va., LB **$733,000,** (Combined Bid), BANK, 300 block, N. Washington St., and BRANCH OFFICE King and Royal Sts., LB **$509,000,** Main Bldg., LB **$230,000,** Branch, ALEXANDRIA, VA. Alexandria National Bank, King and Royal Sts., Alexandria, Va. Bids Sept. 7. CD 8/23.

Trinkle & Dobyns, Inc., Box 606, Dublin, Va. CA **$789,192,** Marion HIGH SCHOOL and addn. to Carnegie SCHOOL, MARION, VA. Smyth Co. School Bd. Supvs., Marion, Va. Echols-Sparger & Assocs., Box 391, Marion, Va., archts. CD 5/13/55.

Leslie Constr. Corp., Box 74, London Bridge, Va., CA Est. **$500,000,** MOTEL, NORFOLK, VA., Airport Motor Inn, Inc., 515 Military Hy., Norfolk, Va. CD 8/31.

▲ **J. B. Denny Co.,** 1158 Willghby Bay Ave., Norfolk, Va., CA Est. **$2,500,000,** SHOPPING CENTER, ROANOKE, VA., Towers Shopping Center, Inc., Colonial and Brandon Aves., Roanoke, Va., (**Correction**—contractor.) CD 12/15, under CA.

Vipperman Constr. Co., 19-21 Bypass, Beckley, W. Va., CA **$893,752,** general contract National Guard ARMORY and CIVIC CENTER, BECKLEY, W. VA. State Armory Bd., State House, Charleston, W. Va., Bids May 19, CD 7/6, under LB.

Godley Constr. Co., Inc., 4805 Rozzells Ferry Rd., Charlotte, N. C., CA Est. **$150,000,** 40,000 sq. ft. WAREHOUSE ADDN., CHARLOTTE, N. C. F. D. &

M. R. Godley, 4804 Rozzells Ferry Rd., Charlotte, N. C.

Southeastern Constr. Co., 301 W. 2nd St., Charlotte, N. C., CA Est. **$125,000,** DYEING and FINISHING PLANT, LABORATORIES alterations, CHARLOTTE, N. C., Celanese Corp. of America, Barclay Downs Dr., Charlotte, N. C. Bids Aug. 16. CD 8/11.

City Homes, Inc., 505 S. Ashe St., Greensboro, N. C. Day Labor, **$500,000,** 40 RESIDENCES, Westridge Heights Subdivision, GREENSBORO, N. C.

Superior Constr. Corp., 1053 Oakmont Ave., Greensboro, N. C., CA **$492,900,** 53 HOUSE DEVELOPMENT, Lincoln Heights, GREENSBORO, N. C. Eugene Gulledge, 1053 Oakmont Ave., Greensboro, N. C. CD 2/2.

Wilson-Legare, Inc., 517 W. Gaston St., Greensboro, N. C., Day Labor, **$750,000,** 50 RESIDENCES, GREENSBORO, N. C.

Herman-Sipe & Co., Inc., Conover, N. C., CA Est. **$125,000,** MANUFACTURING PLANT ADDN., HICKORY, N. C., Hickory Chair Co., c/o James Sherrill, archt., 307 2nd St. N. W., Hickory, N. C. CD 7/2/59.

Weldon Devlopment Corp., Weldon, N. C. Owner Builds, **$150,000,** FACTORY, WELDON, N. C. Carolins Sleepwear Corp., lessee. CD 7/6.

Jones Bros. & Co., 417 Lodge St., Wilson, N. C., CA **$692,195,** 90 HOUSING units, Project NC 20-1a and NC-20-2a, WILSON, N. C. Wilson Housing Auth., Gold Professional Bldg., Wilson, N. C. CD 9/8.

Campbell, Lowrie & Latermilch, 400 W. Madison St., Chicago, Ill. CA Est. **$225,000,** MANUFACTURING PLANT, ATLANTA, GA. Lloyd A. Fry Roofing Co., 5818 Archer Rd., Chicago, Ill.

Maynard Johnston & Co., P. O. Box 19654, Atlanta, Ga. LB **$510,957,** Emory University, HOSPITAL ADDN., ATLANTA, GA. Elk's Aidmore Children's Convalescent Hospital, 800 Aidmore Dr. N. E., Emory University, Ga. Bids Aug. 30. CD 8/12.

Timothy McCarthy Constr. Co., Inc., 1785 Cheshire Bridge Rd., NE, Atlanta, Ga., Separate Contracts, **$125,000,** WAREHOUSE-OFFICE, 3475 Hamilton Blvd. S. W., for lease, ATLANTA, GA.

Piehl Engineers, 309 Bluff Ave., North Augusta, S. C., CA **$130,000,** MFG. PLANT addn., AUGUSTA, GA. Homestead Drapes, Bransford Rd., Augusta, Ga.

Danlee Constr. Co., P. O. Box 8466, Jacksonville, Fla., CA Est. **$750,000,** MOTOR HOTEL, Jekyll Island, BRUNSWICK, GA. A. J. B., Inc., 702 Hendricks Ave., Jacksonville, Fla. CD 8/5.

▲ **A. B. Newton & Co.,** P. O. Box 191, Vidalia, Ga., LB **$1,124,505,** HOSPITAL, CARTERSVILLE, GA. Bartow Co. Hospital Auth., Courthouse, Cartersville, Ga. Bids Sept. 8. CD 8/18.

N. D. Horton, Jr., Eatonton, Ga., Day Labor, **$600,000,** 63 RESIDENCES, Woodland Heights subdivision, EATONTON, GA.

Uplands Constr. Co., 1145 Peachtree St. N. E., Atlanta, Ga., CA Est. **$775,000,** 100 RESIDENCES, JONESBORO, GA. Habersham Development Co., 1145 Peachtree St. N. E., Atlanta, Ga.

Boone & Smith, Inc., 320 S. Cobb Dr., Smyrna, Ga., CA Est. over **$500,000,** 5 story AUTO PARKING GARAGE, MARIETTA, GA. Jack W. Boone, 320 S. Cobb Dr., Smyrna, Ga.

Uplands Constr. Co., 1145 Peachtree St. N. E., Atlanta, Ga., CA Est. **$775,000,** 100 RESIDENCES, SMYRNA, GA. Nordick, Inc., 1145 Peachtree St. N. E., Atlanta, Ga.

Feldman Bldg., Corp., 605 Lincoln Rd., Miami Beach, Fla., CA Est. over **$750,000,** HOTEL addn., FORT LAUDERDALE, FLA. Lago Mar Hotel, 1700 S. Ocean Lane, Fort Lauderdale, Fla.

W. F. Thompson Co., 3228 Ponce DeLeon Blvd., Coral Gables, Fla., LB **$619,022,** (15 bidders). Bascom Palmer Eye Institute, NW 10th Ave. and NW 17th St. MIAMI, FLA. Bd. Comrs. Dade Co. 10th Floor, Courthouse, Miami, Fla, Bids 9/6. CD 8/17.

▲ **Thomas Constr. & Erection Co.,** 2503 5th Ave., S., Birmingham, Ala., CA Est. **$2,000,000,** general contract Brick PLANT ADDN., BESSEMER, ALA. H. K. Porter Co., Inc., 2800 Alabama Ave., Bessemer, Ala. CD 6/23.

Brice Building Co., 1021 2nd Ave., N. Birmingham Ala. CA **$220,000,** WAREHOUSE ADDN., 3201 1st Ave. N., BIRMINGHAM, ALA. Southern Railway System, 2201 1st Ave. N., Birmingham, Ala.

Shenesey & Kay, P. O. Box 331, Anniston, Ala., LB **$776,417,** DINING HALL, JACKSONVILLE, ALA., Jacksonville State Teachers College, Jacksonville, Ala. Bids Sept. 1. CD 8/3.

▲ **Batson-Cook Co.,** P. O. Box 151, West Point, Ga., CA Est **$1,500,000,** Phenix Plaza SHOPPING CENTER, PHENIX CITY, ALA. Aronov Realty Co., 42 S. Court St., Montgomery, Ala. CD 9/12.

† **T. H. Sneed,** 422 Pass Rd., Gulfport, Miss., LB **$537,086,** (5 bidders), FAMILY DWELLING, etc. for head of Passes West Jetty Light Station and South Pass range rear Light Station, Mississippi River, South Pass. Inv. 089-61, LOUISIANA. 8th Coast Guard Dist., Custom House Bldg., New Orleans 16, Mo.

H. A. Lott, Inc., Box 25005, Houston, Tex., LB **$718,900,** (10 bidders), 140 married student HOUSING UNITS, BATON ROUGE, LA. Louisiana State University, Purchasing Agent, Baton Rouge, La. Bids Sept. 7. CD 8/16.

▲ **Farnsworth & Chambers Co., Inc.,** 3601 Brock St., Houston, Tex., LB **$1,034,000,** Elsie Park HIGH

3.*

DAYLIGHTING DO's and DON'Ts

FOR SAFETY-CONSCIOUS ENGINEERS

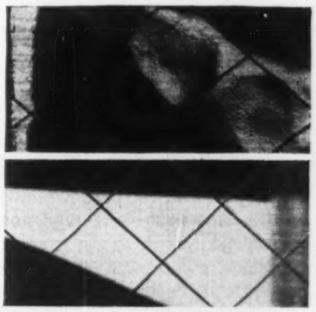
* No. 3 of a series to help Engineers increase plant efficiency and economy.

DON'T expect fire and breakage protection from ordinary window glass.

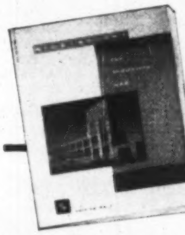
Only glass containing wire mesh qualifies as a fire retardant and enjoys recognition in most state and municipal codes as a safety factor in glazing openings in windows, skylights, partitions, exit doors and other vital areas in buildings.

DO EXPECT MAXIMUM SAFETY and PROTECTION FROM MISSISSIPPI WIRE GLASS . . .

the glass that helps "bottle up" fire . . . the original solid wire glass that is today the standard by which all others are judged.



Available in obscure patterns and polished for clear vision wherever quality glass is sold.



Send for catalog 60-I

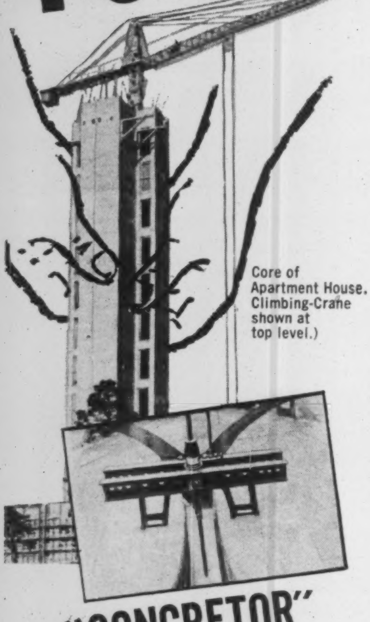
SEE OUR CATALOG IN SWEETS OR WRITE FOR COPY

MISSISSIPPI
GLASS COMPANY
88 Angelica St. • St. Louis 7, Missouri
NEW YORK • CHICAGO • FULLERTON, CALIFORNIA

WORLD'S LARGEST MANUFACTURER OF ROLLED, FIGURED AND WIRED GLASS

CIRCLE 209 ON READER SERVICE CARD

MONEY-SAVING, UNIFORM LIFTING POWER



Core of Apartment House. Climbing-Crane shown at top level.)

with "CONCRETOR" HYDRAULIC SLIPFORM SERVICE

because it
Saves time! Concretor equipment raises forms automatically, up to 20 inches an hour!
Saves labor! Only 1 man is needed to operate jacks, regardless of the number of jacks!
Produces uniform and simultaneous lifting power at all pertinent lifting points. This results in significant economies!

CONCRETOR HYDRAULIC SLIPFORM SERVICE is adaptable to all types of vertical construction. Used across the U.S.A. for apartment houses, silos, chimney pedestals, sub-structures for water reservoirs, bridge piers, factories, etc. On the job engineers are available.

FREE: Write for specifications and job studies. Dept. EN-9

B. M. HEEDE, INC.

30-01 37th Ave., Long Island City 1, N.Y.
San Francisco: 630 Sixth St. Montreal: 625 Faillon St.

SCHOOL, GRETNA, LA. Jefferson Parish School Bd., 519 Huey Long Ave., Gretna, La. Bids Sept. 7. CD 8/16.

A. B. Newton, Vidalia, Ga., LB **$424,399,** 36 unit low RENT HOUSING, BARBOURVILLE, KY., Barbourville Municipal Housing Comm., Barbourville, Ky. Bids Sept. 7. CD 8/12.

John Wile Constr. Co., 826 Humler St., Louisville, Ky. LB **$622,000,** (6 bidders), COUNTY HIGH SCHOOL, CAMPBELLSVILLE, KY. Taylor County Fiscal Court, Campbellsville, Ky., Bids Sept. 7. CD 8/30.

Newton & Rushton, P. O. Box 191, Vidalia, Ga., CA **$633,517,** Proj. Ky. 22-1, Ky 22-2, 60 units HOUSING, LEBANON, KY. City, Municipal Housing Comn., Lebanon, Ky. Bids Aug. 30, awarded Sept. 6. CD 9/7, under LB.

John Wile Constr. Co., 326 Humler St., Louisville 11, Ky. LB **$604,850** (12 bidders), general contract California Wheatley ELEMENTARY SCHOOL, LOUISVILLE, KY. Louisville Bd. Educ., 5th and Hill St., Louisville, Ky., Bids Sept. 7. CD 8/16.

First Christian Church, 354 Lancaster, Richmond, Ky., rejected bids Sept. 1, 2 story brick on concrete block CHURCH, RICHMOND, KY. **$425,000.** Edwin Keeble, 2000 Glen Echo Rd., Nashville, Tenn., engr. CD 8/12.

John C. Becking, 324 James Blvd., Signal Mountain, Tenn., CA **$120,000,** WAREHOUSE, CHATTANOOGA, TENN. Tennessee Paper Mills, Manufacturers Rd., Chattanooga, Tenn.

Brownlee & Kesterson Constr. Co., P. O. Box 411, Knoxville, Tenn., LB **$466,717,** Rule Junior High SCHOOL addn., KNOXVILLE, TENN. City Bd. Educ., 624 Lamar St., Knoxville, Tenn. CD 8/20.

MIDDLE WEST

HEAVY CONSTRUCTION—BA

† **Indiana**—BA 9/29—TACTICAL FACILITIES—U. S. Engs., 526 South Clark St., Chicago 5, Ill., conversion of tactical facilities at Sites C-46 and C-47, Lake and Porter Counties, ENG-11-032-61-11.

▲† **Michigan**—BA 9/29—U. S. Eng., 1101 Washington Blvd., Detroit, Zone 31, dredging west approach to locks, St. Marys Falls Canal, St. Marys River, Sault Ste. Marie, CIVENG-20-064-61-10. Under $2,000,000. CD 9/7.

† **Ohio**—BA On Or About 10/5—U. S. Eng., 502 8th St., Huntington 1, W. Va., unmanned gap filler facility, Bainbridge, ENG-46-022-61-4. $75,000.

† **Ohio, Kentucky, West Virginia**—BA About 10/6—U. S. Eng., 502 8th St., Huntington 1, W. Va., clearing Greenup Pool between Lock and Dam No. 29 and Gallipolis Locks and Dam, Ohio River, Lawrence and Gallia Counties, Ohio, Boyd and Lawrence Counties, Kentucky, and Wayne Cabell and Mason Counties, West Virginia, CIVENG-46-022-61-14.

† **Indiana**—BA 10/6—U. S. Eng., Louisville Dist., P. O. Box 59, Louisville, Ky., channel imprvs., Salamonie River, near Portland, CIVENG-15-029-61-11. $150,000. Plans deposit $1.60.

† **Ohio and West Virginia**—BA 10/12—U. S. Eng., 925 New Federal Bldg., Pittsburgh 19, Pa., removal Lock and Dam 8; removing Lock and Dam 9 and dredging, Ohio River, Serial No. CIVENG-36-058-61-7, $400,000.

BUILDINGS—BA

† **Ill., Great Lakes**—CANOPIES—BA 9/27—Dist. P. Wks. Office, Ninth Naval Dist., Bldg. 1-A, restoration and strengthening canopies, Bldgs. No. 3501, 3502, 3503, Naval Supply Depot, Spec. No. 31084, $25,000-$100,000. CD 9/25/59.

† **Michigan**—INDUSTRIAL TYPE BLDGS.—BA 10/6—U. S. Eng., 1101 Washington Blvd., Detroit, Zone 31, industrial type concrete, masonry, prefabricated metal bldgs. with all utilities, K. I. Sawyer Air Force Base, Marquette, Mich., CD 10/30/50; and Kincheloe Air Force Base, Mich., CD 7/26. $700,000, ENG-20-064-61-14.

HEAVY CONSTRUCTION—LB & CA

▲ **OHIO**—Dpt. Hys., State Dpt. Bldg., Columbus, Zone 15, Bids opened 6/28.

John G. Rohlin Constr. Co. & Herman H. Miller & Son, 1024 Home Ave., Akron, O., CA **$2,446,442,** Type T 71, structure 3.4 mi., USR 224-2.58, F-FG 458(18), Proj. 295, Summit Co. CD 7/7.

Fauber Constr. Co., N. 9th St., Lafayette, Ind., CA **$531,342,** East-West Runway, taxiways, apron., Contr. 1; airfield lighting system, Contr. 2, LAFAYETTE, IND. Treasurer, Executive Bldg., Purdue University, West Lafayette, Ind. Bids July 14. CD 7/5.

▲ **ILLINOIS**—Dpt. P. Wks. & Bldgs., Div. Hys., Centennial Bldgs., Springfield,

McDougal-Hartman Co., 3101 N. Adams St., Peoria, Ill., CA **$1,006,582,** (3 bidders), paving, ramps, grade separation Morton Ave. over FAI 74 north of Morton, Tazewell Co. Bids 8/5. CD 8/10.

Abbot Constr. Co., 5789 N. Lincoln Ave., Chicago, Zone 45, Ill., LB **$347,188,** rehab. Troop Housing areas, Sites C-61, C-72 and C-93, CHICAGO, ILL. U. S. Eng., 536 S. Clark St., Chicago, Ill. Bids Aug. 23, CD 8/2.

▲ **Malan Constr. Corp.**, 2 Park Ave., New York, N. Y., LB **$18,366,000,** two terminal bldgs., O'Hare International Airport, CHICAGO, ILL. City Dpt. Purchases, City Hall, Chicago 2, Ill. Bids Sept. 12. CD 8/3.

Union Contg. & Eng. Co., 2035 W. 43rd St., Chicago, LB **$440,343,** (5 bidders), No. 90.63-60-21; paving W. 55th St., Cicero to Artesian Aves., CHICAGO, ILL., Dpt. Purchases, City Hall, Chicago 2, Ill. Bids Sept. 6, CD 9/1.

▲ **WISCONSIN**—State Hy. Comn., Madison,

Wis.—**John F. Bloomer, Inc. & R. B. Vickery Co.,** 341 W. College Ave., Appleton, Wis., CA **$1,343,350,** grade, subbase, Structures B-44-29 and B-44-28, 3.355 mi., Contr. 1, USH 41, Appleton-East Co. line Rd. Proj. F 03-2(60), Outagamie Co.;

Wis.—**Boulanger Constr. Co. & O'Keefe Constr. Co.,** 638 N. Superior St., De Pere, Wis., CA **$943,461,** grade, subbase, Structures B-44-36 and B-44-35, 3.743 mi., USH 41, Contr. 2, Appleton-East County Line Rd., Proj. F 03-2(60), Outagamie Co., Bids Aug. 23. CD 8/26, under LB.

† **A. J. Etkin Constr. Co.**, 10111 Capital Ave., Oak Park 37, Mich., LB **$250,841,** rehabilitation existing structures at Special AAA sites, vicinity of Detroit, ENG-20-064-51-1, MICHIGAN. U. S. Eng., 1101 Washington Blvd., Detroit, Mich. Bids Aug. 18. CD 8/8.

Dryer Bros. 2606 N. Saginaw St., Midland, Mich., CA **$531,251.** Contr. 2, Div. E, 12- to 20-in. water mains, CADILLAC, MICH. City, City Hall, Cadillac, Mich. Bids July 8. CD 7/28, under LB.

† **Base Procurement Office,** K. I. Sawyer Air Force Base, Gwinn, Mich., received no bids Aug. 22, b. conc. paving and repair roads, Calumet Air Force Station, IFB 20-613-61-9, CALUMET, MICH. Will readvertise. CD 8/8.

Detroit Concrete Prod. Corp., 19209 W. Davison, Detroit 23, Mich., CA **$168,476,** PW-2896, recapping residential streets, various locations, DETROIT, MICH. City, City-County Bldg., Detroit 26, Mich. Awarded Aug. 17. CD 3/30/43.

† **Fullerton Constr. Co.**, 1916 Filer Ave., Detroit 12, Mich., LB **$195,000,** est. $100,000-$200,000, 1 story steel hangar type structure, metal siding and roof deck, metal filled or drilled caissons fdn., all utilities, paving, etc., ENG-20-064-61-3, SELFRIDGE AIR FORCE BASE, MICH. U. S. Eng., 1101 Washington Bvd., Detroit 26, Mich. Bids Sept. 7, CD 8/3.

BUILDINGS—LB & CA

▲ **Bedford Co.**, 3763 Lee Rd., Bedford Heights, O. Owner Builds, **$1,000,000,** 100 frame RANCH HOMES, Columbus and Richmond Rds., BEDFORD HEIGHTS, O. CD 6/3/59.

▲ **Murphy Bros., Inc.**, 7945 Hamilton, Mt. Healthy, O., Own Forces, Approx. **$1,290,000,** 70 HOUSES, L-fl., 1½ story, brick, bsmnt., second section, Colerain Pike subdivision, CINCINNATI, O. Awarded Sept. 1. Edward Niemeier, 4484 Harrison Ave., Cincinnati, O., engr.; **Robert Beddle & Son,** 4381 Creek Rd., Blue Ash, O., CA **$145,000,** paving, sewer-water lines for second section (70 lots) of Colerain Pike subdivision, (Cincinnati, O.).

Price Development Co., 8690 Hollyhock, Cincinnati, O., Own Forces, **$750,000,** 30 1-fl., 2 story, bsmnt., brick HOUSES, off View Place, CINCINNATI, O. Awarded Sept. 3. Edward Niemeier, 4484 Harrison, Cincinnati, O., engr.;
B. J. Constr. Co., Inc., 5163 Cleves Warsaw, Cincinnati, O., CA **$85,000,** paving, sewer-water lines for 30 lots, off View Place, (Cincinnati, O.).

▲ **Hoelzl-Martini Constr. Co.**, 1[illegible]51 Brookpark Rd., Cleveland 9, O., LB **$1,427,800,** est. $2,200,000, (7 bidders), general contract, Churchill-Orville Ave. JUNIOR HIGH SCHOOL, CLEVELAND, O. Bd. Educ., 1380 E. 6th St., Cleveland 14, O. Bids opened Sept. 2. CD 8/12.

Merritt-Chapman & Scott, Standard Bldg., Cleveland 13, O., CA **$160,000,** remodel GRAIN ELEVATOR, first contract, 5 loading platforms, 4 mooring cells in Maumee River, TOLEDO, O. Northwestern Mutual Insurance Co., 720 E. Wisconsin St., Milwaukee, Wis. Cargill, Inc., 741 N. Milwaukee St., Milwaukee, Wis., lessee.

Havco Inc., Lake and Neva, Addison Ill., CA **$792,933,** RESIDENCE HALL, CHILDREN'S HOME, ADDISON, ILL., Lutheran Child Welfare Assn., W. Lake St., Addison, Ill. CD 7/25.

J. L. Simmons Co., 506 S. Wabash Ave., Chicago 5, Ill., CA **$751,400,** 3 story, 78x50 ft. COLLEGE FRATERNITY HOUSE (5), CHICAGO, ILL. Illinois Institute of Technology, 10 W. 33rd St., Chicago, Ill. Bids July 26, awarded Sept. 1. CD 8/11, under LB.

† **Jos. J. Duffy Co.**, 4994 Elston Ave., Chicago, Ill., CA **$742,289,** 3 story, 138x194 ft. irreg. Van de Graaff addn. to BLDG. NO. 203, Argonne National Laboratory, LEMONT, ILL. U. S. Atomic Energy Comn., 9800 S. Cass Ave., Argonne, Ill. Bids Aug. 16, awarded Sept. 1. CD 7/28/59.

MISSISSIPPI TO ROCKIES

HEAVY CONSTRUCTION—BA

Mo., **St. Louis County**—BA 9/29—Metropolitan St. Louis Sewer Dist., 2000 Hampton Ave., St. Louis, Zone 10, sanitary sewers, involving 20,300 lin. ft. 8 and 10 in. sewers, all manholes, etc. Special Benefit Subdistrict 69, City of Dellwood. Letting No. C-55. $200,000. CD 1/30/59.

Minn., **Minneapolis**—BA 10/4—Hennepin Co., grade, gravel base, concrete curb and gutter, storm sewer, road-mixed bit. base, etc., and Bridge Nos. 7263, 7264 and 7265, 1.6 mi. between Valley View Rd. (west TH 100) and Zerxes Ave. in Edina, SP 27-66-01

(CSAH 62), Minn. Proj. U-106-1(2). $778,000. Plans deposit $7.40. L. P. Pederson, co. hy. engr. CD 9/6, under LB.

† **N. M., Roswell**—RE-ENTRY VEHICLE FACILITIES—BA About 10/11—U. S. Eng., P. O. Box 1538, Albuquerque, re-entry vehicle facilities, incl. minor modifications to 3 existing structures, plus constr. high bay masonry addn. with 5 ton bridge crane, utilities, etc. Walker Air Force Base, ENG-29-005-61-2 $100,000. Plans deposit $10. CD 9/9/58.

Mo., St. Louis—BA 10/11—Bd. P. Service, 304 City Hall, Zone 3, compacted earth fill, involving 110,000 cu. yd. earth in oroposed Water Division Service Yards at Chain of Rocks Water Works Pumping Station. $110,000. CD 6/6.

† **Minn., Duluth**—SHELTER, AIRCRAFT WEAPONS CALIBRATION—BA About 10/13—U. S. Eng., 1217 U. S. Post Office & Custom House, St. Paul, Zone 1, 1 story, 72x82 ft. weapons calibration bldg. incl. 14x18 ft. shop and storage wing, Duluth Air Force Base, ENG-21-018-61-9. $200,000. Plans deposit $2. CD 11/3/59.

▲† **Minnesota**—BA 10/18—U. S. Eng., 1217 U. S. Post Office & Custom House, St. Paul, Zone 1, 1,029,000 cu. yd. dredging channel, St. Anthony Falls extension, Mississippi River. Over $1,000,000. Extended date. CD 7/27.

BUILDINGS—BA

Minn., Bemidji—RESIDENCE HALL—BA 9/27—Minn. State College Bd., 41 Sherburne Ave., St. Paul, at Bemidji, Minn., women's residence hall, 200 beds. $753,000. Melander, Fugelso & Assocs., 603 Alworth Bldg., Duluth, engrs. CD 7/21.

Minn., Winona—HEATING PLANT, etc.—BA 9/28—State Dpt. Admin., 19 State Capitol, St. Paul, heating plant and service lines, Winona State College. $583,500. Plans deposit $50. Helmick & Lutz, 1801 Nicollet Ave., Minneapois, engrs. CD 10/22.

Tex., Carrollton—FACTORY—BA 9/30—Glidden Paint Center, 5420 Palms Center, Houston, (selected list of bidders), 50,000 sq. ft., masonry, steel frame paint factory unit, Josey Lane, $725,000. CD 8/25.

▲ **Minn., Red Wing**—SCHOOL—BA 10/4—Bd. Educ. Independent School Dist. No. 256, 4 story Central high school addn., alterations. $1,200,000. Plans deposit. $40. Toltz, King, Duvall, Anderson & Assocs., 1408 Pioneer Bldg., St. Paul, archts. CD 4/13.

† **Kan., Fort Leavenworth**—NIKE-HERCULES FACILITIES, etc.—BA 10/13—U. S. Eng., 1800 Federal Office Bldg., Kansas City 6, Mo., Nike-Hercules facilities, field maintenance shop, ENG-23-028-61-13. $300,000. Plans deposit $10. CD 9/5/58.

Okla., Lawton Comanche—POST OFFICE—BA 11/2—Post Office Dpt. Box 1632, Oklahoma City, lease and construct docks and parking facilities, 4th and B Sts. Over $500,000.

BUILDINGS—SLC

Ark., North Little Rock—PIPELINE TERMINAL—Gulf Oil Corp., 127 Elk Pl., New Orleans, La., soon lets contract, pipe-line terminal, (warehouse, tank installation, grading) ½ mi. north of U.S. Hy. 70 and 1¼ mi. from east city limits.

▲ **Minn., Winona**—HOSPITAL—Sisters of the Third Order Regular of St. Francis, Assisi Heights, Rochester, soon lets contract, 5 story St. Anne Hospital Home for Aged, W. Broadway and Lee St. $1,500,000. Maguolo & Quick, 3329 Glenmore Ave., Cincinnati, O., archts. Flad-Smith & Assocs., 525 Junction St., assoc. archts. CD 8/24.

▲ **Tex., Dallas**—HOSPITAL—Saint Paul's Hospital, 3121 Bryan St., soon lets contract, 10 story, 412,000 sq. ft., concrete frame, air-conditioned hospital, $10,000,000. CD 8/16.

▲ **Tex., San Antonio**—SHOPPING CENTER—Wonderland Regional Shopping Center, (Community Realty Co., 3022 E. Houston St.), soon lets contract, shopping center, parking area, Loop 13 and Fred Rd. North-South Expressway. $2,175,000. Date advanced. CD 9/2.

HEAVY CONSTRUCTION—LB & CA

▲ **MINNESOTA**—State Hy. Dpt., Capitol Approach, St. Paul,

Woodrich Constr. Co., 201 18 Ave. South, Hopkins, Minn., CA **$1,647,131**, crushed rock base, plant mixed bit. surf. and concrete pavement 5 mi. near Dexter, Mower Co. Bids Aug. 5, CD 8/10, under LB.

MINNESOTA—State Hy. Dpt., Capitol Approach, St. Paul, Bids opened 9/9,

Minn.—**Park Constr. Co.**, 51 37 Ave. N. E., Minneapolis 37, Minn., LB **$149,734**, (3 bidders) gravel base, bit. surf. etc. Maintenance District No. 9. SP Nos. 7002 and 7008, St. Paul;

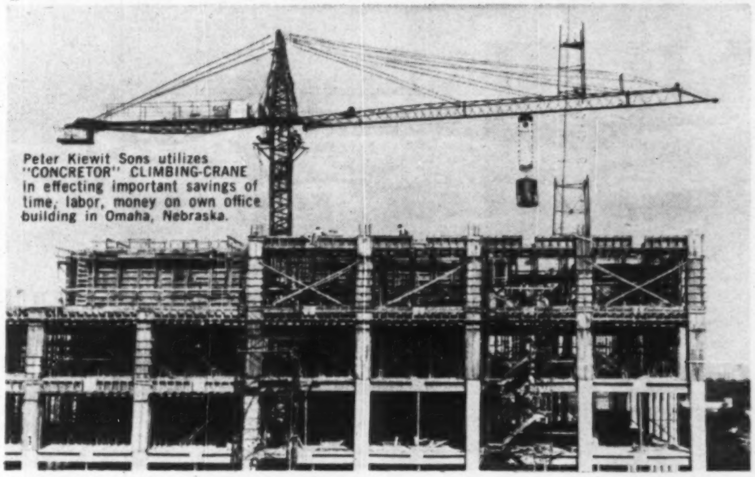
Minn.—**Bituminous Surface Treatment Co.**, Inver Grove (St. Paul), Minn., LB **$97,386**, (2 bidders) concrete base and bit. surf. Maintenance District No. 11, St. Paul. CD 9/2.

J. E. **Barsness**, Glenwood, Minn., LB **$109,059**, (9 bidders) grading, gravel surf. 6.5 mi., FERGUS FALLS, MINN. Otter Tail County, Fergus Falls, Minn. Bids Sept. 6. CD 8/18.

Hoover Constr. Co., Box 51, Virginia, Minn., LB **$123,303** (3 bidders) gravel base, bit. surf. and seal coat, etc. 2 mi. in and near TWO HARBORS, MINN. Lake Co., Two Harbors, Minn. Bids Sept. 7. CD 8/19.

▲† J. E. **Latta Constr. Co., Inc.**, and **Latta Bridge Co., Inc.**, 6609 Latta Pl., St. Louis 35, Mo., LB **$2,168,914**, est. $2,068,566, (8 bidders), 710 lin.

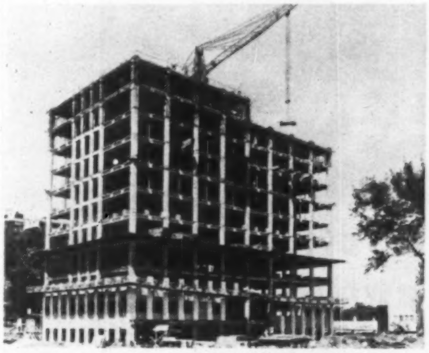
HOW "CONCRETOR" CLIMBING-CRANES REVERSE RISING CONSTRUCTION COSTS



Peter Kiewit Sons utilizes "CONCRETOR" CLIMBING-CRANE in effecting important savings of time, labor, money on own office building in Omaha, Nebraska.

The **"CONCRETOR" CLIMBING-CRANE** goes up with the building while work is in progress ... 2-3 floors at a time ... the sky's the limit. Climbs by its own hoisting winch on floors or inside elevator shafts.

"CONCRETOR" CLIMBING-CRANES quickly and efficiently place loads "on a dime"... up to 100 foot radius due to the 360 degree swing of its 100 foot jib. They eliminate the need for street access and expensive rehandling of materials over unnecessary ramps and runways, thus substantially lowering operating costs ... while also serving to keep community relations on a pleasant, friendly level.



Scandinavian "CONCRETOR" CLIMBING-CRANES are recommended for all types of construction including industrial, apartment and office buildings, silos, water towers, bridges and viaducts. Perfect when slipped with "CONCRETOR" hydraulic slipform equipment (see adv. opposite page).

Crane is remote-controlled by one man from working deck with 3½ lb. electronic panel. He is free to move to any part of the job, and to assist in loading and unloading.

LOWER CAPITAL INVESTMENT! "CONCRETOR" CLIMBING-CRANES cost about half of what you'd expect to pay for earth-bound cranes of similar capacity. Experience has shown that with ordinary use, the cost of a "CONCRETOR" CLIMBING-CRANE can be amortized over a period of about 2 years. CHOICE OF 4 MODELS – RENTAL/PURCHASE PLANS. Delivered anywhere in U. S. Factory-trained service engineers available.

Versatile combined climbing **and** traveling crane. Can be used on rails or in a fixed position.

B. M. HEEDE, INC.
30-01 37th Ave., Long Island City 1, N. Y.

B. M. HEEDE CALIFORNIA, INC.,
630 Sixth Street, San Francisco 3, Cal.

DISTRIBUTOR FRANCHISES AVAILABLE in a few selected territories. Write Dept. DF for details.

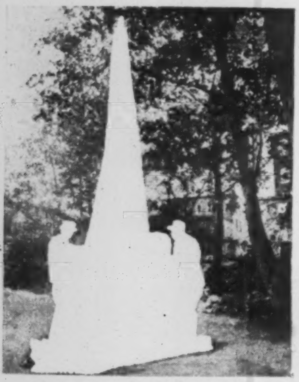
MAIL COUPON FOR LOW COST DETAILS AND FREE LITERATURE

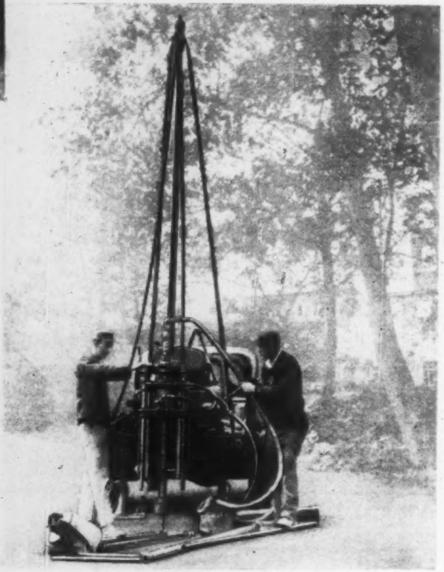
B. M. Heede, Inc. 30-01 37 Ave., L. I. C. 1, N. Y.
☐ Send me "CONCRETOR" CLIMBING-CRANE literature and price list.
☐ I am interested in ☐ Buying ☐ Rental-Purchase
Company ....
Address ....
Town .... Zone ...... State ....
My Name .... Title ....
EL-9

CIRCLE 211 ON READER SERVICE CARD

IS THERE A VOID IN YOUR DRILLING PROGRAM

?





FILL IN THIS VOID

WITH STURDY . . . DEPENDABLE . . .
SPRAGUE & HENWOOD EQUIPMENT

Many progressive and successful firms throughout the United States and in foreign countries want and use no other core drilling equipment except Sprague & Henwood's. They have found it to be rugged . . . easy to use . . . versatile. Are you having trouble? You might just have the wrong equipment. Why not write to Sprague & Henwood today and describe your present drilling conditions, or the drilling conditions you expect to encounter. Sprague & Henwood will supply you with equipment and complete drilling information, enabling you to go far toward filling the void in your drilling program.

Look for our emblem... It's your Seal of Quality

SPRAGUE & HENWOOD, Inc.
SCRANTON 2, PA.
MEMBER OF DIAMOND CORE DRILL MANUFACTURERS ASSOC.

New York—Philadelphia—Nashville—Pittsburgh—Grand Junction, Colo.—Buchans, Nfld.
Export Division: Sprague & Henwood International Corporation, 11 W. 42nd St., New York, N.Y.

ft. earthen levee, 1,080 lin. ft. rein.-con. floodwall, two pumping stations, concrete intake and discharge chambers, Proj. Items L-1, F-1, S-2, P-1 and P-2 flood protection St. Louis. ENG-23065-61-4, MISSOURI. U. S. Eng., 420 Locust St., St. Louis 2, Mo. Bids Sept. 8. CD 7/29.

J. E. Latta Constr. Co., Inc., & Latta Bridge Co., Inc., 6609 Latta Pl., St. Louis 33, Mo., CA **$882,040**, Proj. 23-A, steel, concrete bridge over Deer Creek, concrete paving, grading, drainage, etc. and Proj. 23-B, concrete paving and concrete service roads and two concrete bridges at Missouri Pacific R. R. and Big Bend Blvd., Maplewood, ST. LOUIS COUNTY, MO. St. Louis County, Court House, Clayton 5, Mo. Bids Sept. 1, awarded Sept. 8. CD 9/8, under LB.

▲ **ARKANSAS**—Arkansas Hy. Comn., Capitol, Little Rock,

Ark.—**Reynolds & Williams**, 3200 Brown, Little Rock, Ark., CA **$559,811**, 6.51 mi. grading, Interstate Route 40 east of North Little Rock to Lonoke county line, Pulaski Co., CD 9/7, under LB;

Ark.—**Graves Bros. Contractors**, Dollaway Rd., Pine Bluff, Ark., CA **$621,438**, 6½ mi. reconstruction, incl. surfacing, U.S. Hy. 79 from near junction of St. Hys. 88 and 79 west of Altheimer to Wabbaseka, Jefferson Co.;

Ark.—**HMB Constr. Co.**, Texarkana, Tex., CA **$199,308**, 0.87 mi. grading, drainage structures and surfacing, U.S. Hy. 82 from junction of U.S. Hys. 67 and 82 to Texarkana city limits, Miller Co. Grand total $1,380,557. CD 8/23.

† **National Park Service, Dpt. Interior**, Regional Director, Region 2, 307 Federal Office Bldg., Omaha, Neb., rejected bids Aug. 18, 2 concrete block comfort stations, Cottonwood, South Unit campground, plumbing facilities, sanitary fixtures, electric lighting water, sewer, heating facilities, Theodore Roosevelt National Memorial Park, Proj. TR W 293, NORTH DAKOTA. CD 7/22.

† **McCormic Erling Co.**, 633 1st Ave. N, Fargo, N. D., CA **$837,969**, runway and taxiway extensions, warm up park, Hector Field, ENG-25-066-60174, FARGO, N. D. U. S. Eng., 1709 Jackson St., Omaha, Neb. CD 7/6.

† **H. Halverson, Inc.**, 901 S. 6th, Grand Forks, N. D., LB **$351,598**, shop and ARM electronics (ADC), Grand Forks Air Force Base, ENG-25-066-61-21, GRAND FORKS, N. D. U. S. Eng., 1709 Jackson El, Omaha, Neb. CD 8/22.

H. Halverson, 901 So. 6th, Grand Forks, N. D., LB **$348,327**, (3 bidders), shop arm and electronics, (ADC) Minot Air Force Base, MINOT, N. D. U. S. Eng., 1709 Jackson St., Omaha, Neb. CD 8/12.

▲† **Bushman Constr. Co.**, Schneider Bldg., St. Joseph, Mo., CA **$1,093,548**, constr. Arcadia Diversion Dam and about 7,000 ft. Sherman Feeder Canal, Farwell Unit, Missouri River Basin Proj., Custer Co. SP DC 5357, NEBRASKA, Bureau Reclamation, Dpt. Interior, St. Paul, Neb. Bids July 28. CD 8/4, under LB.

Missouri Valley Constr. Co., P. O. Box 811, Grand Island, Neb., CA **$119,322**, soil cement base, armor coat and asphaltic cement surfacing various county roads., GRAND ISLAND, NEB. Hall County, Courthouse, Grand Island, Neb. Thomas & Benjamin & Clayton, P. O. Box 783, Grand Island, Neb., engrs. Bids Aug. 19.

OKLAHOMA—State Hy. Dpt., Capitol 5, Oklahoma City,

Brooks & McConnell, 5020 NW 16th St., Oklahoma City 7, Okla., CA **$905,738**, c. conc. 4.347 mi., I-35 north of State Hy. 333, Logan Co. Bids Aug. 26, awarded Sept. 7. CD 8/31, under LB.

Central Elec. Constr. Co., 1880 E. Admiral, Tulsa, Okla., LB **$479,000**, 132 kv transmission line, from Pensacola to Miami, OKLAHOMA, Grand River Dam Auth., Vinita Okla. Bids Sept. 6. CD 8/31.

Ames Constr. Co., 6000 W. 39th St., Oklahoma City, Okla., CA **$165,870**, storm sewers, NICHOLS HILLS, (OKLAHOMA CITY P.O.) OKLA. City, City Hall, Nichols Hills, Okla. CD 7/27.

Nueces Electric Cooperatives, Robstown, Tex., Owner Builds, **$110,000**, pole line extensions and replacements, Robstown area, TEXAS. CD 6/9.

Poka-Lambro Rural Telephone Co-operative, Inc., Tahoka, Tex., Owner Builds, **$140,000**, rural pole lines, Tahoka, TEXAS. CD 5/6.

† **U. S. Eng.**, Box 1600, Fort Worth, Tex., cancelled bids to have been opened Aug. 18, liquid oxygen facility, incl. 4,000 sq. ft. metal masonry oil storage, 400 sq. ft. 28,000 gal. liquid oxygen storage (Dewar) 28,000 gal. liquid nitrogen storage (Dewar) transfer system, equipment fdn. pad, parking area, access roads, fences, site utilities, Dyess Air Force Base, ENG-41-443-61-2, ABILENE, TEX. Project postponed indefinitely CD 7/25.

City of Austin, City Hall, Austin, Tex., Owner Builds, **$175,000**, WW rehabilitation unit, AUSTIN, TEX. CD 8/10.

City of Austin, City Hall, Austin, Tex., Owner Builds, **$150,000**, sanitary sewerage system rehabilitation work, AUSTIN, TEX. CD 8/10.

K. F. Hunt & H. & F. Concrete, 5924 S. Staples St., Corpus Christi, Tex., LB **$141,109**, (5 bidders), concrete sewers, appurtenances, CORPUS CHRISTI, TEX. City of Corpus Christi, City Hall, Corpus Christi, Tex. CD 8/22, under LB.

West Texas Co. (Subsidiary, Helmerich & Payne), 1st Nat'l Bank Bldg., Tulsa, Okla., CA **$600,000**, earthwork-water flooding, unitization, White and Baker field, FORT STOCKTON, TEX. Helmerich & Payne, 1st Nat'l Bank Bldg., Tulsa, Okla. CD 8/25.

Hunt County, Comrs. Court, Courthouse, Greenville, Tex., Owner Builds, **$136,164**, General road repairing, imprvs., drainage, GREENVILLE, TEX. Constr. 1960 CD 7/25.

(Continued on page 214)

ONE pump becomes MANY . . . saving you pump dollars . . . giving you a wide range of clear water, non-clog and other liquid-handling modifications . . . when you standardize your pumping operations with Fairbanks, Morse ADAPT-*ABLE* pumps.

F-M ADAPT-*ABLES* consist of a pump frame and simple adapter to which can be attached a wide variety of F-M hydraulic ends with enclosed, semi-open or non-clog impellers. Conversion is easy . . . inexpensive, too.

F-M ADAPT-*ABLES are "NEMA-Matched":* pump mounting dimensions are standardized with similar dimensions of Nema-driving motors. Gone is the need for make-shift height-adjusting blocks and odd-bore couplings!

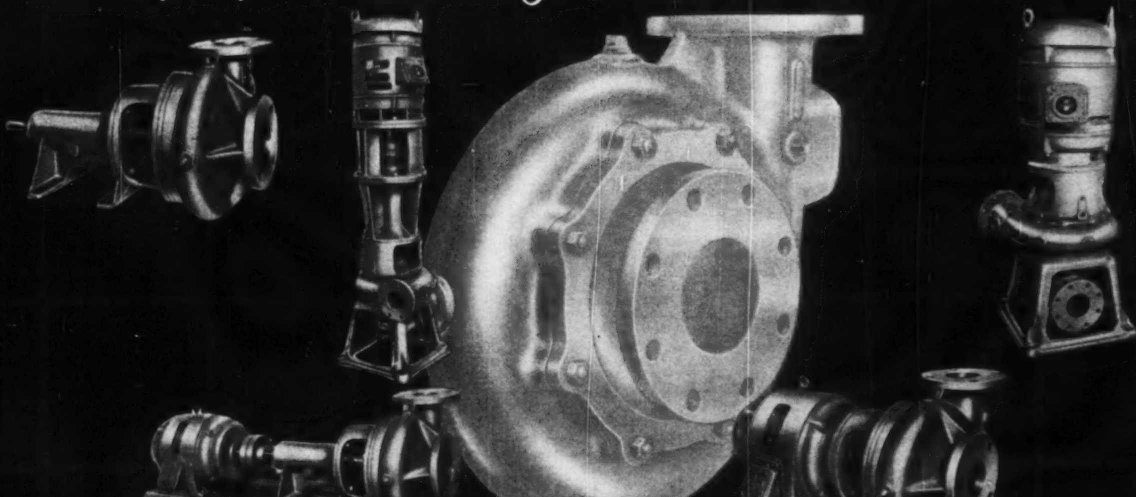
The ADAPT-*ABLE* design means that the most economical frame size may be selected to match the motor horsepower requirements of the pumping job.

And there are other advantages: choice of mechanical seals or conventional stuffing boxes with easy field change-over from one to the other . . . interchangeable bearings for pumps and motors. For special liquid handling problems, hydraulic ends can be specially alloyed to fit the needs: we've been solving such problems for generations.

Regardless of *what* liquids you pump . . . or *where* . . . Fairbanks, Morse builds pumps and *matching* power units for *your* use . . . in a greater range of sizes, types and capacities than *anyone, anywhere.* Start SAVING pump and motor dollars by putting F-M's vast hydraulic experience to work in your plants, process lines and products . . . now!

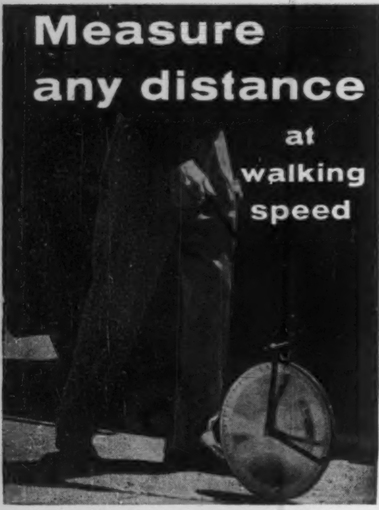
"nema-matched" *adapt-ables*

. . . a lot of pumps in ONE package!



Fairbanks, Morse
THE PROUDEST NAME IN PUMPS
Pump and Hydraulic Division • Kansas City, Kansas

A MAJOR INDUSTRIAL COMPONENT OF **FAIRBANKS WHITNEY CORPORATION**



Measure any distance at walking speed

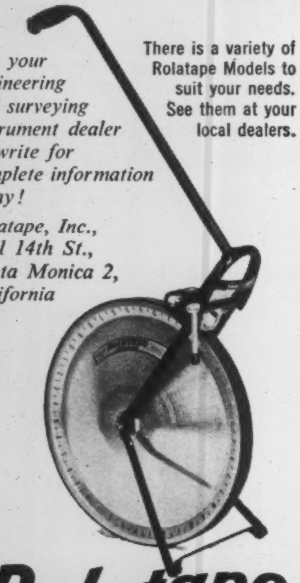
records 100,000 ft. *automatically!*

It's So Easy to measure with a Rolatape . . . and you save time on every estimating job . . . no tapes to wind, no helper is required. You get precision-accurate measurements every time.

Records Feet automatically and the accumulated total is always in full view.

Shows Inches, and Fractions of an inch. Wheel is calibrated in inches and fractions for quick easy reading.

Shows Tenths of a foot. Wheel is calibrated in tenths on reverse side for engineers.



There is a variety of Rolatape Models to suit your needs. See them at your local dealers.

See your engineering and surveying instrument dealer or write for complete information today!

Rolatape, Inc.,
1741 14th St.,
Santa Monica 2,
California

Rolatape

Measuring Wheels

CIRCLE 214 ON READER SERVICE CARD

(Continued from page 212)

▲ **City Public Service Bd.**, 145 Navarro St., San Antonio, Tex., Owner Builds, **$1,600,000**, No. 2, electric sub-station; installations electric distr'b. circuits and transformers; No. 2, Gas plant, SAN ANTONIO, TEX. CD 6/4/53,

City Water Bd., 506 Dolorosa St., San Antonio, Tex., Owner Builds, **$150,000**, water lines, older areas; **$125,000**, water lines, subdivisions; **$182,000**, relocating some water lines, acct. State Hy. Dept., SAN ANTONIO, TEX. Grand total, $457,000. CD 8/1/57.

† **Madden Constr. Co.**, Box 5615, Bossier City, La., CA **$616,096**, Part 1, rehabilitation, improv., remodeling 300 Wherry housing units, Perrin Air Force Base, Inv. No. 41-610-60-51, SHERMAN, TEX. U. S. Govt., Base Procurement Office, Bldg. 3905, Perrin Air Force Base, Sherman, Tex. CD 8/23.

E. E. Lewis Plbg. & Hty. Co., P.O. Box 4, Wake Village, Tex., LB **$146,789**, (5 bidders), sewer line extensions, imprvs., TEXARKANA, TEX. Texarkana Suburban Municipal Water Supply Co., Texarkana, Tex. CD 8/26.

K & W Constr. Co., 4805 Marion Circle, Corpus Christi, Tex., CA **$148,336**, county-wide road imprvs., VICTORIA, TEX. Victoria County, Comrs. Court, Courthouse, Victoria, Tex. Bids 8/8. CD 7/25.

R. A. King Sons, c/o Shell Oil, Shell Bldg., Houston, Tex., CA **$325,000**, earthwork-unitization for waterflooding Zone 2 field, WICHITA FALLS, TEX. Shell Oil Co. & R. A. King Sons, Shell Bldg., Houston, Tex. CD 8/18.

Mann Constr. Co., 2700 South Glati, Englewood, Colo., CA **$415,412**, water and sewage imprvs., DILLON, COLO. Dillon Improvement Corp., Town Hall, Dillon, Colo. CD 8/25.

Robbins Constr. Co., 3855 Inca, Denver, Colo., LB **$157,472**, est. $175,000, covered concrete storage reservoir for Southeast Englewood Water District, ENGLEWOOD, COLO. City, City Hall, Englewood, Colo. Bids Sept. 8, CD 8/25.

BUILDINGS—LB & CA

D'Arcy Leck Constr. Co., 2838 Stevens Ave., Minneapolis, Minn., CA **$350,000**, 1 story, 62x87 ft. STORAGE BLDG., MINNEAPOLIS, MINN. Minneapolis Brewing Co., 1215 Marshall St. N. E., Minneapolis, Minn. K. M. Clark Eng. Co., 2815 Wayzata Blvd., Minneapolis, Minn., engr.

Worthington Corp., 807 13 Ave. S., Minneapolis, Minn., LB **$388,300**, (4 bidders), 2,500 KW dual-fuel electric GENERATING UNIT and equip., MORA, MINN. Village, Village Hall, Mora, Minn. Bids Sept. 7. CD 9/8.

▲ **Power Service Co.**, 2110 Nicollet Ave., Minneapolis, Minn., CA **$1,035,000**, STEAM GENERATING UNIT, Power Plant, ROCHESTER, MINN. City, City Hall, Rochester, Minn. Bids Aug. 11. CD 8/22, under LB.

▲ **W. A. Klinger, Inc.**, 2015 East Seventh St., Sioux City, Iowa, CA Est. **$1,000,000**, 110 unit, 2 2½ story bldgs., Holiday Inn Motor Hotel, incl., large restaurant, swimming pool, playgrounds, etc., at Isabella Dt., Interchange of Interstate Hy., No. 29, SIOUX CITY, IOWA. Sooland Realty Co., c/o W. A.. Klinger, 2015 E. Seventh St., Sioux City, Iowa.

W. A. Klinger, Inc., 2015 East Seventh St., Sioux City, Iowa, CA Est. **$250,000**, WAREHOUSE, SIOUX CITY, IOWA. Harrison Glass & Paint Co., Sioux City, Iowa.

Robinson Steel Constr. Co., 5545 West Park Ave., St. Louis 10, Mo., LB **$205,880**, (9 bidders), LAUNDRY addn. and laundry equipment, St. Louis State School & Hospital, ST. LOUIS COUNTY, MO. St. Louis State School & Hospital, 10695 Bellefontaine Rd., St. Louis County, Mo. Bids Sept. 8, CD 8/15.

W. A. Klinger. Inc., 2015 E. 7th St, Sioux City, Iowa. CA Est. **$700,000**, Beef and sheep killing PLANT; FARGO, N. D. Needham Packing Co., Fargo, N. D.

Chris Hansen Constr. Co., 1615 E. 7th St., Box 86, Sioux City 2, Iowa, CA **$463,438**, general contract SCIENCE, University of South Dakota, VERMILLON, S. D. Regents of Education, Pierre, S. D. CD 7/27.

Vance & Thurmand, Box 3202, Houston, Tex., CA **$192,235**, PLANT addn., CONROE, TEX. Montgomery County Industrial Fdn. Board Trustees, Conroe, Tex. Sparkler Mfg. Co., lessee. CD 8/19.

Connell Constr. Co., 2110 Hawes St., Dallas, Tex., LB **$728,000**, 2 story, 100,000 sq. ft., steel frame Jesuit HIGH SCHOOL, appurtenances, DALLAS, TEX. Jesuit Fathers Faculty, 3813 Oak Lawn St., Dallas, Tex. Bids 8/30. CD 8/9.

Hoke Smith, Inc., 5008 Greenville Ave., DALLAS, TEX. Owner Builds, **$415,000**, 62 APARTMENT UNITS, DALLAS, TEX. CD 8/25.

Senior Circle Corp. of America, Lee Parks Bld., Hall St., Dallas, Tex., Owner Builds, **$685,500**, 100 unit DEPARTMENT CENTER, DALLAS, TEX. CD 9/7.

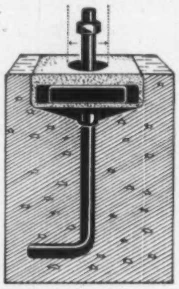
Texmo Corp., Floyd Stone, Denison, Tex., Owner Builds, **$700,000**, Proj. No. 1, 35 DWELLINGS, Thompson Heights, DENISON, TEX.

Weldon Cole & Wayne Bruce, Denison, Tex., Owner Builds, **$432,222**, 32 DWELLINGS, near Industrial Park, DENISON, TEX.

City Poultry Processing Co., 4500 Cochran St., Houston, Tex., Owner Builds, **$250,000**, POULTRY PROCESSING PLANT, HOUSTON, TEX. CD 8/18.

E. M. Lunde Builder, 6439 Kury St., Houston, Tex., Owner Builds, **$436,500**, 14 DWELLINGS, brick, masonry, Timbergrove Manor Subdivision, HOUSTON, TEX.

▲ **Jas. E. McDaniels & Frank Thilen, Contractors**, 9507 Braeburn Glen, Houston, Tex., Owner Builds, **$1,293,150**, 131 DWELLINGS, "Sheldon Woods", Sheldon Rd. and Hy. 90, HOUSTON, TEX. CD 7/20.



NEW!
DECO Anchor BOLT Fitting*

Now avoid wasted time in correcting misplaced bolts. Eliminate hoisting and lowering machine over bolts. Area free for storage or traffic as there are no projections above floor. Adjustability of bolt provides sufficient movement to correct errors made in setting. Malleable iron housing has more strength than its companion bolt. Available in sizes ⅜" to 1½" . . . bolt diameters. See our listing in Sweets. *Pat. App. For.

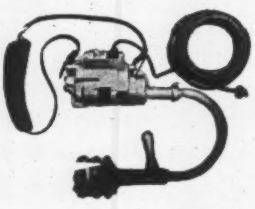
BROCHURE MAILED UPON REQUEST

Available from stock now

DECATUR ENGINEERING CO.
519 E. William **Decatur, Ill.**

CIRCLE 45 ON READER SERVICE CARD

"BERG"
CONCRETE SURFACER
MODEL A



"BERG" equipment is used extensively for surfacing and finishing applications on concrete construction.

The many "BERG" Models available permit exact selection for your particular application.

The distinctive "BERG" features give you the kind of results that are realized in better quality work, combined with lower costs.

"BERG" Heads and Attachments are interchangeable, thereby providing adaptability for vibrating, wire brushing, sanding and polishing applications.

THE CONCRETE SURFACING MACHINERY CO.
4667 SPRING GROVE AVE.
CINCINNATI 32, OHIO

CIRCLE 44 ON READER SERVICE CARD

Sentinel Chemicals, Inc., 3011 San Jacinto St., Houston, Tex., Owner Builds, **$200,000**, PLANT, Wingate St., HOUSTON, TEX. CD 3/9/59.

▲ **O. R. Winter, Builder**, 3302 Norfolk St., Houston, Tex., Owner Builds, **$1,250,000**, MOTOR INN; **$750,000** LODGING CONVENIENCE CENTER, HOUSTON, TEX. CD 7/5.

W. R. Craig Constr. Co., 114 W. Glenview St., San Antonio, Tex., CA **$418,218**, 2 APARTMENTS, total 72 units, west of Babcock Rd., SAN ANTONIO, TEX. W. R. Craig, 1214 Basse Rd., San Antonio, Tex. CD 8/24.

▲ **McKenzie Constr. Co.**, P.O. Box 806, San Antonio, Tex., CA **$4,213,000**, 6 story, garden-type MOTOR HOTEL, swimming pool, parking utilities, SAN ANTONIO, TEX. R. Dumas Milner, Milner Enterprises, 1090 Milner Bldg., Jackson, Miss. CD 7/5.

Robert Ross, Contractor, 6109 S. Flores St., San Antonio, Tex., Owner Builds, **$400,000**, 64 unit APARTMENT, SAN ANTONIO, TEX. CD 9/1.

▲ **Craftsmen Constr. Co.**, 1337 E. 18th Ave., Denver, Colo., CA **$1,209,949**, est. $1,160,000, (5 bidders), 3 story, 113x42 ft.; one story, 90x34 ft., 9x48 ft., women's DORMITORIES, two story, 170x43 ft., 19x12 ft., men's DORMITORY, one story, 14,000 sq. ft. DINING HALL, one story, 102x27 ft. each; 28 two-bedroom units Student Family APARTMENTS, ALAMOSA, COLO., State Planning Div., State Office Bldg., Denver, Colo. Bids Aug. 18. CD 8/26.

K. L. House Constr. Co., 6409 Acoma Rd. S.E., Albuquerque, N. M., LB **$321,073**, (8 bidders), 80,000 sq. ft. WAREHOUSE, 1400 Block Broadway N.E., ALBUQUERQUE, N. M. Springer Transfer Co., 121 Tijeras Ave. N.E., Albuquerque, N. M. Wm. E. Ellison, 324 Yale Blvd. S.E., Albuquerque, N. M., archt.-engr.

FAR WEST

HEAVY CONSTRUCTION—BA

Calif., Los Angeles—BA 9/30—Los Angeles County Flood Control Dist., 2250 Alcazar St., Proj. 403, Northwest Alhambra Storm Drain, Alhambra, Los Angeles and South Pasadena. $530,400. Plans deposit $2.60. CD 11/10/58.

▲† **Calif., Lemoore**—AIRCRAFT FUEL PIPE LINE, etc. —BA 10/5—Dist. P. Wks. Office, 12th Naval Dist., San Bruno, aircraft fuel pipe line from Estero Bay to Naval Air Station, incl. 16 in. cathodically protected, submarine line approx. 2,950 ft. long, etc., electrical equipment bldg., supporting services and facilities, incl. electrical work, water storage, etc., Naval Air Station. NBy-29252, Spec. No. 29252/60. Over $1,000,000. CD 7/22.

Calif., Costa Mesa—BA 10/17—City, imprvt. Santa Ana St., etc., incl. sewers and water mains. $250,000. Plans deposit $15.

† **Idaho, Mountain Home**—HANGAR ADDN.—BA 10/19 —U. S. Eng., Walla Walla Dist., Bldg. 602, City-County Airport, Walla Walla, Wash., 8,800 sq. ft., steel frame addn. to hangar bldg., installation tanks, etc., for guided missile assembly and technical supply facilities, ENG-45-164-61-7. $400,000. Plans deposit $6. CD 7/5.

BUILDINGS—BA

Calif., Oxnard—SCHOOL—BA 10/4—Oxnard Elementary School Dist., 255 Palm Dr., cement block and wood frame, Fremont School, Gonzales and Ventura Rds. $400,000. Plans deposit $5. Kenneth Hess, 3212 Loma Vista Rd., Ventura, archt. CD 4/14/59.

Calif., Los Angeles—POLICE STATION—BA 10/5—City, City Hall, University Police Station, 1546 Santa Barbara Ave. $600,000. Plans deposit $35. Kistner, Wright & Wright, 1125 W.6 St., archts.

Calif., Fresno—GYMNASIUM—BA 10/11—State Div. Architecture, 1120 N St., Sacramento, 34,000 sq. ft. women's gymnasium and remodeling 12,700 sq. ft. existing bldg., Fresno State College. W.O. 4304GC-22. $700,000. Plans deposit $50. CD 8/7/59.

HEAVY CONSTRUCTION—LB & CA

UTAH—State Rd. Comn., State Capitol, Salt Lake City, Zone 14, Bids opened 9/6,

Fife Constr., Box 563, Brigham City, Utah, LB **$296,298**, est. $359,000, (8 bidders), bit. surf. 12.064 mi. State Rd. 70. Proj. S-0543(1), Box Elder Co. CD 8/18.

† **UTAH**—Bureau P. Rds., 1750 S. Redwood Rd., Salt Lake City, Bids opened 9/6,

L. A. Young & Sons, 343 S. State St., Salt Lake City, Utah, LB **$371,141**, (7 bidders), 2.387 mi. Forest Hy. Beaver-Puffer Lake. Proj. 29-C, Beaver Co. CD 8/19.

▲ **South Davis Co. Sewer Imprvt. Dist.**, 2022 S. Main, Bountiful, Utah, rejected bids Aug. 24, sewer treatment plant, BOUNTIFUL, UTAH. LB **$1,078,790**. Will re-advertise. CD 9/8, under LB.

ARIZONA—State Hy. Dpt., 206 S. 17th Ave., Phoenix, Bids opened 9/1,

Fisher Contg. Co., Box 6306, Phoenix, Ariz., LB **$532,090**, est. $558,395 (10 bidders), grading, draining, select material, aggr. base, b. conc. and emulsified asphalt seal coat, U.S. Route 60 approx. 6 mi., Phoenix-Globe Hy., Maricopa Co. CD 8/23.

† **Vinell Corp.**, 1145 Westminster, Alhambra, Calif., LB **$996,370**, (6 bidders), construction earthwork and structures for main output drain and Gila River Pilot channel, Gila River siphon to Colorado River, Colorado River Front Work and Levee system, DC-5384, YUMA,

(Continued on page 218)

1 of many jobs you can do with amazingly versatile

WELD-CRETE®

Example: Weld-Crete at work

Here you see a badly spalled and worn concrete railing on highway bridge. How can it be repaired?

Weld-Crete was used to permanently bond new concrete to the old concrete surface. Result? The railing looks like new!

Ask your building supply dealer about Weld-Crete or write us direct for fact-packed literature. Address Box 5938-I, Larsen Products Corporation, Bethesda 14, Md.

Today, for as little as 4c per square foot, you can permanently bond new concrete directly to old concrete . . . or to any sound surface . . . no matter how smooth. The answer is Weld-Crete . . . the patented, free flowing liquid bonding agent used by leading contractors and builders the world over . . . on thousands of new construction, remodeling and repair jobs . . . large and small.

With Weld-Crete you can bond cement toppings to old floors, patches to walks and drives, new concrete to concrete block, concrete slab, bond skim coat of parging, mud coat for tile to any surface, stucco to any surface . . . even machine mounts and pads as thin as ½".

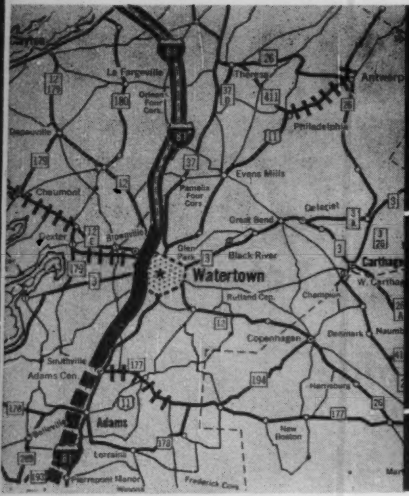
You can use Weld-Crete with complete confidence. Job-proven for 10 years. Tested by Froehling & Robertson, Pittsburgh Testing Laboratory etc. Used by U.S. Army Corps of Engineers, U.S. Navy, G.S.A. Approved for use in New York City by New York City Board of Standards & Appeals, and in the city of Los Angeles by the Board of Building & Safety Commissioners.

LP LARSEN PRODUCTS CORPORATION

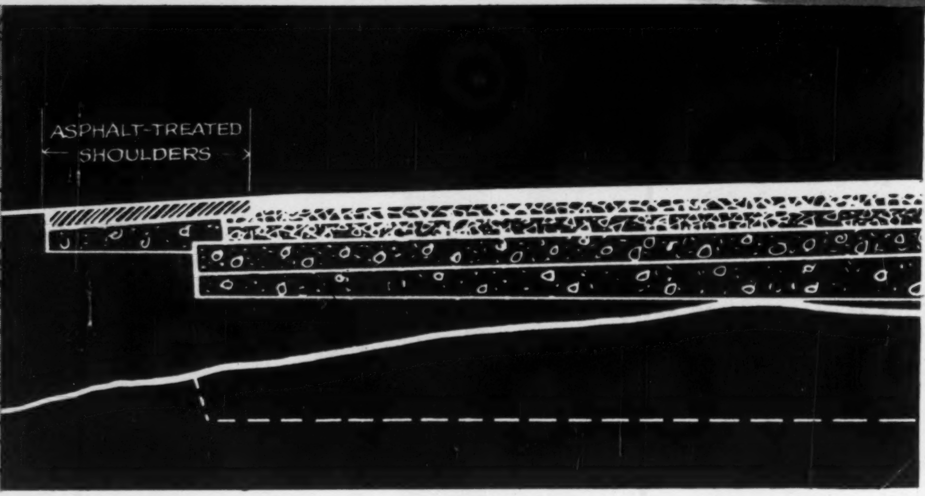
First with the finest in bonding agents

CIRCLE 215 ON READER SERVICE CARD

CIRCLE 217 ON READER SERVICE CARD→


La Fargeville
Theresa
Antwerp
Philadelphia
Evans Mills
Chaumont
Dexter
Brownville
Great Bend
Black River
Watertown
Carthage
Copenhagen
Denmark
Smithville
Adams Cen.
Adams
Lorraine
New Boston

Map shows location of Interstate #81 in Watertown area.


ASPHALT-TREATED SHOULDERS

Cross-section diagram shows composition of single 24-foot roadway on four-lane Interstate & Defense Highway #81. Note Asphalt-treated shoulders.

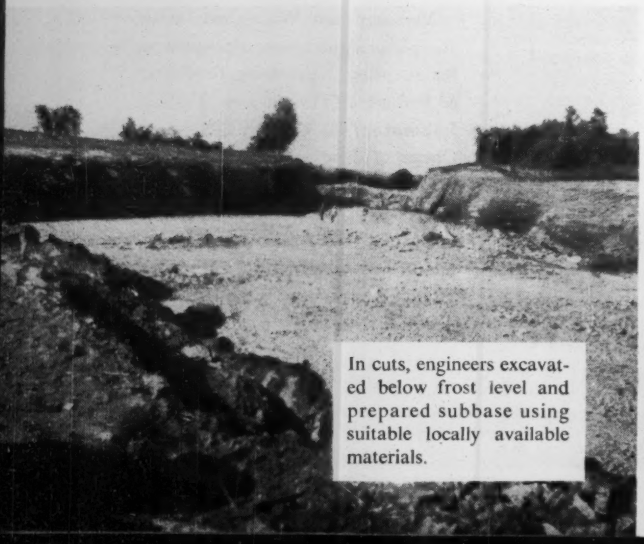
Look what they're doing with DEEP STRENGTH Asphalt Pavement in Upstate New York!

Advanced Asphalt Pavement design, over prepared subbase, solves problems in area where frost depth goes to 48 inches

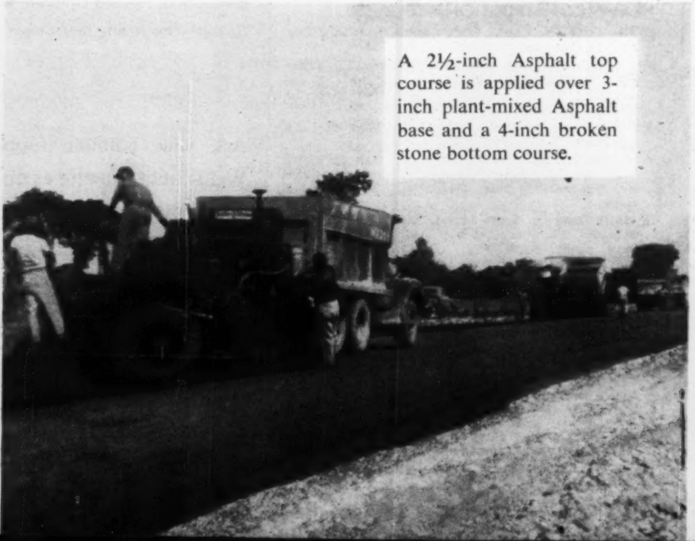
Boulder-strewn glacial till near Watertown presented New York State Highway Department engineers with unusual problems. Here, winter temperatures often reach 20° to 25° *below* zero. The frost depth extends to 48 inches. In cuts, severe frost action sometimes forces boulders *through* the pavement with subsequent break-up and failure.

The cross-section and diagram on this page show how DEEP STRENGTH Asphalt pavement design solved the problems. Notice how the precepts of new DEEP STRENGTH Asphalt design are carried out. They include Asphalt base, Asphalt-treated shoulders, depressed median for good drainage and flat slope embankments for better safety. Capillary moisture action and frost damage are prevented by building the road structure with selected materials.

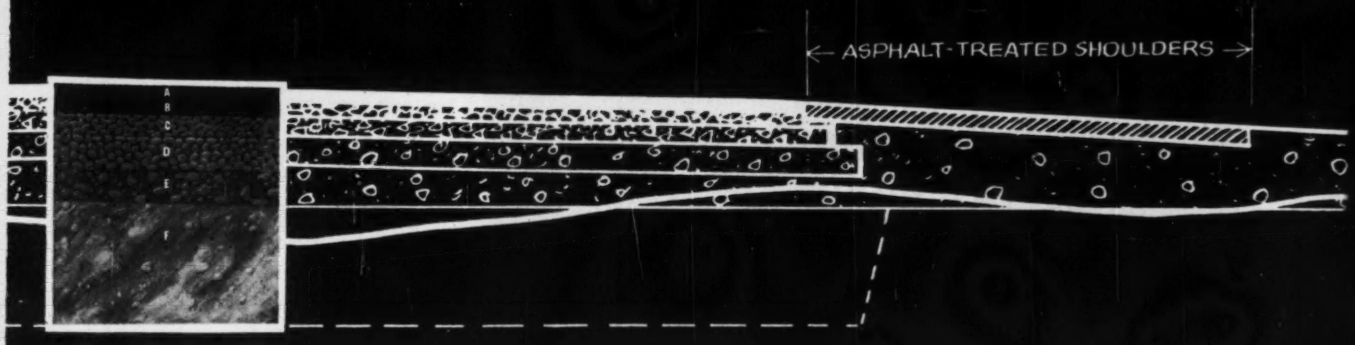
When designed like this—for DEEP STRENGTH—Asphalt pavements will carry the heaviest traffic loads without distress . . . with minimum maintenance cost. For example, the DEEP STRENGTH Asphalt-paved New Jersey Turnpike carried over 46 *million* vehicles during 1959.



In cuts, engineers excavated below frost level and prepared subbase using suitable locally available materials.



A 2½-inch Asphalt top course is applied over 3-inch plant-mixed Asphalt base and a 4-inch broken stone bottom course.



SAVE MONEY, TOO! Modern low-maintenance DEEP STRENGTH Asphalt pavements often cost *less* to build than Asphalt pavements designed to other standards. That's because the **Advanced Design Criteria** often permit Asphalt base to be substituted for some of the more expensive Asphalt concrete surfacing, and allow reduction in total structure thickness when used in place of untreated base.

LOWER MAINTENANCE COSTS result when roads and bridge decks are Asphalt surfaced since **Asphalt pavement does not deteriorate from de-icing salts.** That's one reason why Maryland and Massachusetts are using Asphalt surfaces for all new bridge decks.

SAFER, TOO. On Asphalt pavement, snow and ice melt faster—skid resistance is higher.

THE ASPHALT INSTITUTE
Asphalt Institute Building
College Park, Maryland

THIS IS DEEP STRENGTH

A
2½-inch Asphalt concrete surface course

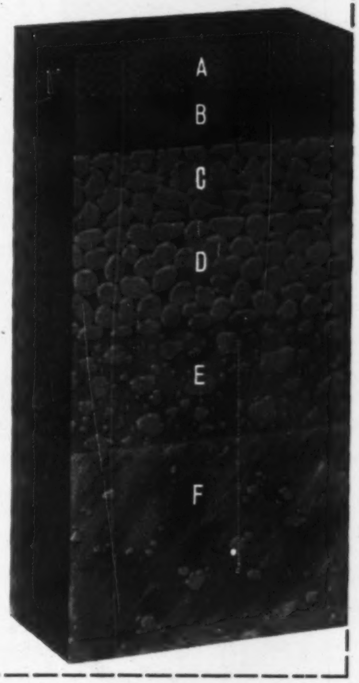
B
3-inch Asphalt base course

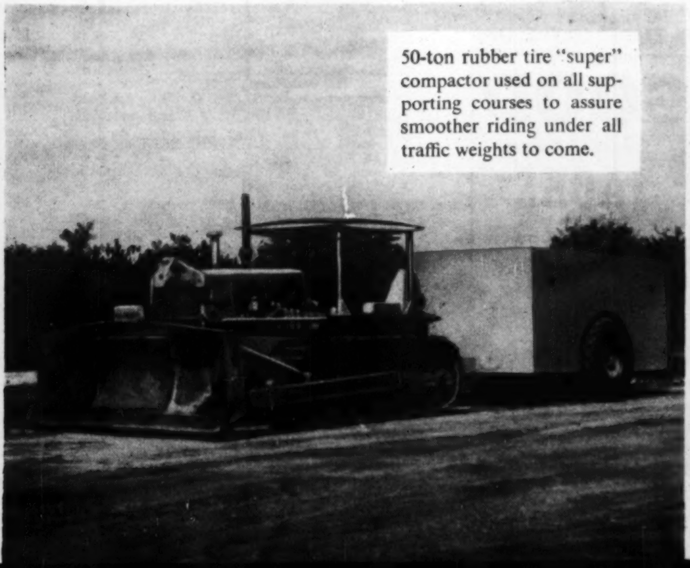
C
4-inch base course of broken stone

D
6-inch graded gravel subbase

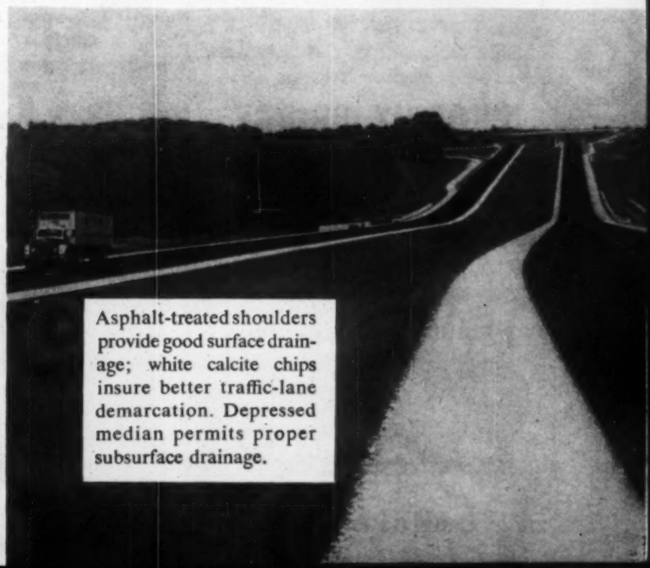
E
6-inch bank-run gravel foundation course

F
Excavated to 48 inches below pavement grade in cuts—locally available backfill material compacted with "super" compactor.

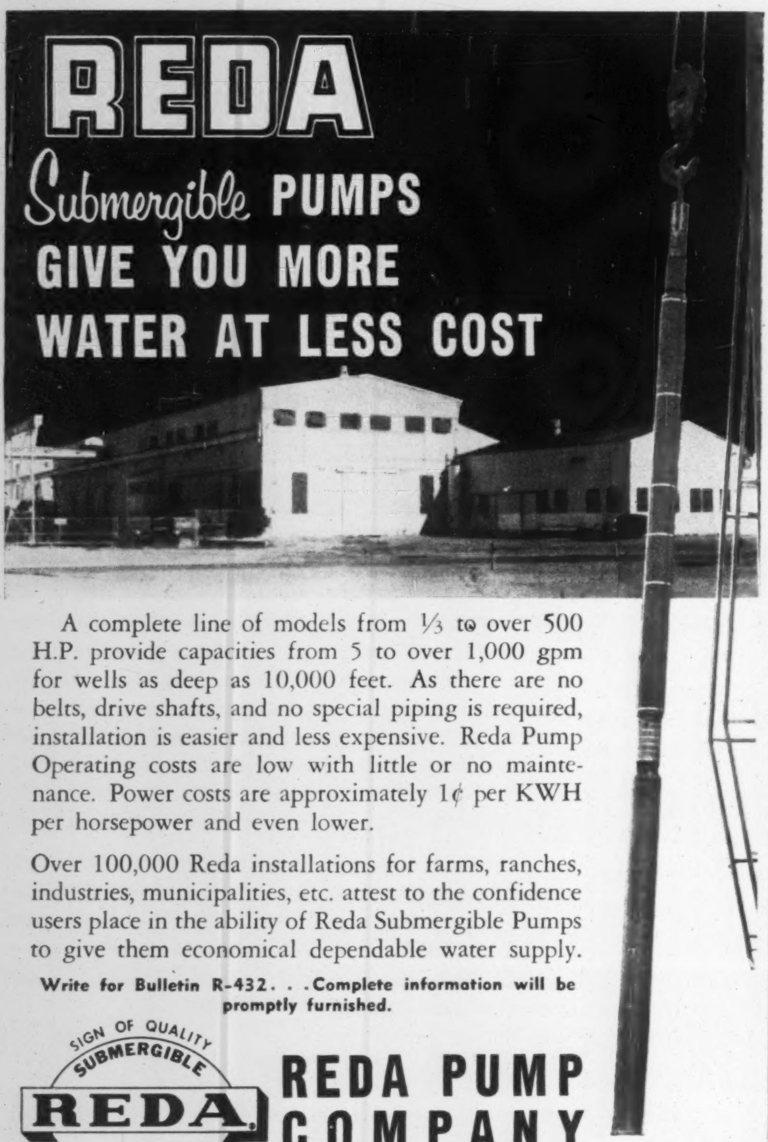




50-ton rubber tire "super" compactor used on all supporting courses to assure smoother riding under all traffic weights to come.



Asphalt-treated shoulders provide good surface drainage; white calcite chips insure better traffic-lane demarcation. Depressed median permits proper subsurface drainage.



A complete line of models from 1/3 to over 500 H.P. provide capacities from 5 to over 1,000 gpm for wells as deep as 10,000 feet. As there are no belts, drive shafts, and no special piping is required, installation is easier and less expensive. Reda Pump Operating costs are low with little or no maintenance. Power costs are approximately 1¢ per KWH per horsepower and even lower.

Over 100,000 Reda installations for farms, ranches, industries, municipalities, etc. attest to the confidence users place in the ability of Reda Submergible Pumps to give them economical dependable water supply.

Write for Bulletin R-432. . . Complete information will be promptly furnished.

SIGN OF QUALITY SUBMERGIBLE REDA PUMPS

REDA PUMP COMPANY
BARTLESVILLE, OKLA.

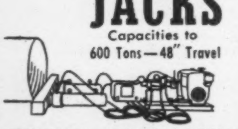
Manufacturers of electric submergible motors and pumps for over 40 years.
Pumps for Oil, Brine, Water, LPG, Gasoline, Jet Fuel.

CIRCLE 47 ON READER SERVICE CARD

PHOENIX BRIDGE COMPANY
Engineers—Fabricators
Erectors
Structural Steel
BRIDGES and BUILDINGS
General Office
and Shops
PHOENIXVILLE, PA.
Subsidiary—Phoenix Steel Corporation

ELGOOD
Hydraulic & Mechanical
JACKS
Capacities to
600 Tons—48" Travel

Jacking Equipment for
Pipe Pushing
Erection
Pile Driving
Pile Testing
Slip Forms
Tunnel Shields
Prestressed Concrete
many other applications



RENTALS — SALES — DESIGN
Large Stock
Immediate Delivery
Write for Job Fact Sheets

ELGOOD EQUIPMENT CORP.
373 Ten Eyck St., Brooklyn, N.Y.
HY 7-5445

CIRCLE 48 ON READER SERVICE CARD

(Continued from page 215)

ARIZ. Bureau Reclamation, Dpt. Interior, Bldg. 1A, Denver Federal Center, Denver, Colo. CD 8/15.

▲ **NEVADA**—Directors Dpt. Hys., State Hy. Bldg., Carson City, Bids opened 9/8,

Nev.—**Isbell Constr. Co.**, 3113 S. Virginia St., Reno, Nev., LB **$1,666,548**, (6 bidders), constr. 7.981 mi. US Hy. 395 from near North City limits of Reno to 8 mi. North, Proj. F-003-2(10), Contr. 1086, Washoe Co.;

Nev.—**Whiting Bros. Constr. Co., Inc.**, Las Vegas, Nev., LB **$187,938**, (4 bidders), constr. portion of primary Hy. 93 and 466 between Henderson and Boulder City 9.854 mi. Proj. F-006-1(12) and 006-1 (State 1), Contr. 1085, Clark Co. CD 8/24.

▲ **WASHINGTON and OREGON**—State Hy. Comn., Dpt. Hys., Olympia, Wash.,

Paul Jarvis, Inc., 1070 West Ewing, Seattle, Wash., CA **$2,409,163**, bridge over Columbia River, at Biggs Rapids, Klickitat Co., Wash., and Sherman Co., Ore. Bids Sept. 9, CD 2/11, under LB.

† **Pacific Constr. Co.**, Box 7648, Portland, Ore., LB **$233,794**, (3 bidders), water and road sys. in Chanapecosh area, Mount Rainier National Park, WASHINGTON, U. S. National Park Service, Longmire, Wash. Bids Sept. 7. CD 8/15.

▲ **WASHINGTON**—State Hy. Dpt., Transportation Bldg., Olympia,

U. S. Steel Corp., American Bridge Div., 309 S. W. 6 Ave., Portland, Ore., CA **$2,962,524**, steel superstructure and rein.-con. deck for bridge over Columbia River at Vantage, Kittitas and Grant Counties. CD 9/1.

Washington Asphalt Co., 309 W. 39th St., Seattle, Wash., LB **$155,956**, (2 bidders), grading, surf. principal arterials, CLYDE HILL, WASH. Town, Town Hall, Clyde Hill, Wash. Bids Sept. 8. CD 9/1.

† **L. Hopkins Co.**, Box 930, Pasco, Wash., LB **$172,517**, (2 bidders), re-entry facilities, Inv. 61-1, MOSES LAKE, WASH. U. S. Eng., City-County Airport, Walla Walla, Wash. Bids Sept. 7. CD 8/17.

† **Purvis Constr. Co.**, 509 Sprague Ave., Spokane, Wash. LB **$164,115**, est. $152,243, (6 bidders) 72 x 80 ft., steel frame aircraft weapons calibration bldg., ENG-45-108-61-13, SPOKANE, WASH. U. S. Eng., 1519 S. Alaskan Way, Seattle, Zone 4, Wash. Bids Sept. 9 CD 8/9.

J. Adron Troxell, 3613 E. 43rd Ave., Seattle, Wash. LB **$309,800**, est. $346,000, (3 bidders), dredge Columbia River, Vancouver, Wash., to Bonneville Dam, CIVENG-35-026-61-25, OREGON and WASHINGTON. U. S. Eng., Pittock Block, Portland, Ore. CD 8/18.

Oregon Constr. Co., Inc., 2134 Fairgrounds Rd. N.E., Salem, Ore., CA **$162,606**, 4.296 lin. ft. 12- to 16-in. trunk sewer, 9,235 lin. ft. 10- to 12-in. lateral sewer, 8,570 lin. ft. 10- to 15-in. storm sewer, WOODBURN, ORE. City, City Hall, Woodburn, Ore. Bids July 28. CD 7/14.

† **CALIFORNIA**—Bureau P. Rds., 133 Hermann St., San Francisco, Bids opened 8/30,

M. J. Coleman Co., P. O. Box 463, Paradise, Calif., LB **$202,355**, (2 bidders), grading, concrete bridge at Blue Creek, Klamath National Forest, Siskiyou Co. CD 8/12.

CALIFORNIA—State Div. Hys., 1120 N St., Sacramento, Bids opened 9/7,

Fredrickson & Watson Constr. Co., 873 81 Ave., Oakland, Calif., LB **$862,241**, (11 bidders), 2 lane bridge over Bear River and grading, surf. roadway approaches, State Sign Rte. 24 near Rio Oso, Sutter and Yuba Counties. CD 8/29.

CALIFORNIA—State Div. Hys., 1120 N St., Sacramento, Bids opened 9/7,

Calif.—**Huettig & Schromm, Inc.**, 304 Bryant St., Palo Alto, Calif., LB **$107,194**, (6 bidders), landscaping 2.4 mi. State Sign Rte. 24 west of Lafayette, between Orina Hy. and west of Sunnybrook Dr., Contra Costa Co.;

Calif.—**Brown-Ely Co., Contractors**, 7360 Schmidt Lane, San Rafael, Calif., LB **$98,444**, (4 bidders), reconstr. and drainage imprvs. at four locations on State Sign Rte. 1, between Muir Beach and 5.3 mi. south of Oleum, Marin Co. CD 8/11.

† **CALIFORNIA**—Bureau P. Rds., 133 Hermann St., San Francisco,

Osborn Co., 1443 Edgecliff Lane, Pasadena, Calif., CA **$623,284**, 15.944 mi. California Forest Hy. 68-11, J1, K1, Mill Creek, Proj. IFB R-7-333, San Bernardino National Forest. Bids July 21. CD 7/13.

CALIFORNIA—State Div. Hys., 1120 N St., Sacramento, Bids opened 9/7,

Claude C. Wood Co., 686 E. Lockeford St., Lodi, Calif., LB **$144,361**, (5 bidders), reconstr., wid'n. 4.1 mi. FAS County Rd. 1094 (Eastside Rd.) between Larson and Topaz Lanes near Topaz, Mono, Co. CD 8/29.

† **Harms Bros.**, 5261 Stockton Blvd., Sacramento, Calif., CA **$177,912**, bit. surf. 8.566 mi. Yosemite National Park, CALIFORNIA. Bureau P. Rds., 133 Hermann St., San Francisco, Calif. Bids Aug. 19, CD 8/8.

▲ **Hood Constr. Co.**, Box 2167, Whittier, Calif., CA $1,422,023, Goleta-West Conduit and Elwood distribution sys., GOLETA, CALIF. Goleta County Water Dist., 4699 Hollister Ave., Santa Barbara, Calif. Bids Aug. 24. CD 8/29, under LB.

† **Payne Constr. Co.**, 689 Louisiana St., Oakland, Calif., LB **$246,059**, (5 bidders), aircraft engine inspection and repair shop, ENG-61-31, HAMILTON AIR FORCE BASE, CALIF. U. S. Eng., 180 New Montgomery, San Francisco, Calif. Bids Aug. 31. CD 7/29.

Roads, Inc. & Harold Hastings Co., 350 Hillcrest Dr., Lakeport, Calif., LB **$139,060**, (8 bidders), Adobe Creek Watershed, near LAKEPORT, CALIF. Lake Co. Flood Control & Water Conservation Dist., Courthouse, Lakeport, Calif. CD 7/25/57.

Connolly-Pacific Co., 1925 Water St., Long Beach, Calif., CA **$427,000,** reconstr. Diversion Dike, Pier 4, Middle Harbor, Spec. 4, D.630, LONG BEACH, CALIF. Long Beach Harbor Dpt., 925 Harbor Plaza, Long Beach, Calif. Bids Aug. 24. CD 2/5/58.

E. A. Irish Contracting, Inc., 2944 Gleneden St., Los Angeles, Calif., LB **$678,795,** (3 bidders), Proj. 463, storm drain, Hartsook St., Ben to Colfax Aves., LOS ANGELES, CALIF. Los Angeles County Flood Control Dist., 2250 Alcazar St., Los Angeles, Calif. Bids Sept.. 2. CD 11/10/58.

Misetich Constr. Corp., 7417 Ethel Ave., North Hollywood, Calif., CA **$105,002,** sanitary sewers, Rhodes Ave. and Keswick St. Sewer Dist., LOS ANGELES, CALIF. City, City Hall, Los Angeles, Calif. Bids Aug. 24, awarded Sept. 6. CD 4/8/55.

Pascal & Ludwig, 2240 Parkway Dr., El Monte, Calif., CA **$199,419** (4 bidders), sanitary sewers Pacific Coast Hy. and Figueroa St. Sewer Dist., LOS ANGELES, CALIF. City, City Hall, Los Angeles, Calif. Bids Aug. 31, awarded Sept. 2. CD 4/8/55.

Griffith Co., 1060 S. Broadway, Los Angeles 15, Calif., CA **$148,608,** wid'n. Main St. from Santa Ana Freeway to North city limits, SANTA ANA, CALIF. City, City Hall, Santa Ana, Calif. Bids Aug. 15.

▲† **Carl N. Swenson Co.**, 1095 Stockton St., San Jose, Calif., CA **$1,223,000,** 2 story, bsmnt., rein.-con. walls, floors and data reduction center, Spec. A-2600, MOFFETT FIELD, CALIF. National Aeronautics & Space Admin., Ames Research Center, Procurement Office, Moffett Field, Calif. Bids Aug. 16. CD 9/5, under LB.

Lee C. Hess, 2000 N. Holt Ave., Pomona, Calif., LB **$296,400,** est. $289,109 (7 bidders), imprv. Francis St. and others, Industrial Park Assessment Dist. No. 65, ONTARIO, CALIF. City, City Hall, Ontario, Calif. Bids Sept. 2.

Belon Constr. Co. (Patio Pools), 8026 Fletcher Parkway, La Mesa, Calif., LB **$165,000,** est. $170,000 (6 bidders), two swimming pools, San Diego State College, SAN DIEGO, CALIF. State Div. Architecture, 1100 S. Grand Ave., Los Angeles, Calif. Bids Sept. 7. CD 8/23.

Oahu Constr. Co., 905 Kokea St., Honolulu, Hawaii, LB **$598,479** (7 bidders), Job No. 24-60, constr. roads Improvement District No. 135, Kapalama, HONOLULU, HAWAII. City and Honolulu County, Punchbowl and King Sts., Honolulu, Hawaii. Bids Sept. 1. CD 8/16.

BUILDINGS—LB & CA

† **U. S. Eng.**, 751 S. Figueroa St., Los Angeles, Calif., rejected bids June 28, ENLISTED MEN'S BARRACKS, ADMIN. BLDG. and SUPPLY BLDG., ENG-04-353-60-107, FORT HUACHUCA, ARIZ., LB **$964,165.** CD 7/6, under LB.

† **U. S. Eng.**, 751 S. Figueroa St., Los Angeles, Calif., rejected bids June 23, ENLISTED MEN'S BARRACKS at Electronic Proving Ground, ENG-04-353-60-105, FORT HUACHUCA, ARIZ. **$800,000.** Will re-advertise. CD 6/2.

Bell & Valdez, 14212 Lake Hills Blvd., Bellevue, Wash., Day Labor, **$524,550,** 42 HOUSES, 154th S.E. and S.E. 6th Pl., BELLEVUE, WASH. CD 6/15/54.

† **Teller Constr. Co.**, Box 2288, Idaho Falls, Idaho, LB **$523,980,** (8 bidders), interior construction and related work for Bldg. 333 in Hanford Works, RICHLAND, WASH. Atomic Energy Comn., Hanford Operations Office, P.O. Box 550, Richland, Bids Sept. 7. CD 8/12.

W. J. Straith Co., 413 3rd Ave. W., Seattle, Wash., LB **$564,000,** (4 bidders), 3 story 92x191 ft. rein.-con. ATHLETIC FACILITY BLDG., SEATTLE, WASH. Seattle Tennis Club, 922 McGilvra Blvd., Seattle, Wash. Bids Sept. 7, CD 9/1.

W. J. Straith Co., 413 Third Ave. W., Seattle, Zone 99 Wash., CA **$200,000,** 2 level 52 x 93 ft. rein.-con. and masonry TRUCK GARAGE, SEATTLE, WASH. Consolidated Dairy Product Co., 635 Elliot Ave. W., Seattle, Wash. Bids 7/12. CD 7/7.

School Dist. 333, Tumwater, Wash., rejected bids Sept. 1, 62,000 sq. ft. HIGH SCHOOL, TUMWATER, WASH. LB **$850,000.** Will re-advertise. CD 8/8.

▲ **Viesko & Post**, Box 69, Salem, Ore., CA **$1,306,300** mens DORMITORY, SALEM, ORE. Willamette University, 900 State St., Salem, Ore., Bids Aug. 16. Awarded Aug. 30. CD 8/23.

▲ **Gordon H. Ball & Gordon H. Ball, Inc.**, Concord, Calif., LB **$1,100,000,** 75,000 sq. ft. men's GYMNASIUM, incl. two outdoor swimming pools, Chico State College, CHICO, CALIF. State Div. Architecture, 1120 N St., Sacramento, Calif. Bids Sept. 8. CD 8/5.

▲ **Cotton Constr. Corp.**, 1735 McKinley, National City, Calif., LB **$1,072,000,** (7 bidders), San Marcos HIGH SCHOOL, San Marcos, ESCONDIDO, CALIF. Escondido Union High School, 240 S. Maple Ave., Escondido, Calif. Bids Sept. 7. CD 8/19.

Bank Bldg. & Equipment Co., 200 W. Commonwealth, Fullerton, Calif., CA **$439,749,** 2 story, 14,500 sq. ft., brick OFFICE, 200 W. Commonwealth, FULLERTON, CALIF. Fullerton Savings & Loan, 113 W. Amerige, Fullerton, Calif.

Goodson Co., 1679 N. Laurel St., Upland, Calif., CA **$140,000,** 27,000 sq. ft. WAREHOUSE addn., CITY OF INDUSTRY, CALIF. General Tire & Rubber Co., 717 S. Nogales St., City of Industry, Calif.

▲ **Robert Grant**, 1665 S. Brookhurst St., Anaheim, Calif., Owner Builds, **$1,505,280,** 120 DWELLINGS, Smeltzer St., HUNTINGTON BEACH, CALIF. CD 9/8.

Griswold & Sons, 406 N. Francisca, Redondo Beach, Calif., Owner Builds, **$827,904,** 66 DWELLINGS, Alberta Dr., Tract 3563, HUNTINGTON BEACH, CALIF.

A. L. Gindling, 2960 Wilshire Blvd., Los Angeles, Calif., CA **$487,500,** 39 stucco DWELLINGS, J, G, & F Sts., Tract 1119-3, OXNARD, CALIF. Anna Inc. Co., 2960 Wilshire Blvd., Los Angeles, Calif.

Vance Beaird, 5112 W. Washington Blvd., Los Angeles, Calif., CA **$699,000,** Tonopah ELEMENTARY SCHOOL, LA PUENTE, CALIF. Bassett School Dist., 904 N. Willow Ave., La Puente, Calif. Bids June 30. CD 7/7, under LB.

Carter Co., 2975 Wilshire Blvd., Los Angeles, Calif., Owner Builds, **$550,000,** 4 story, concrete, brick OFFICE, Shatto Pl., LOS ANGELES, CALIF. Richard J. Hunter, 8303 Melrose Ave., Los Angeles, Calif., archt.

Samuelson Bros., 3441 Ocean View Blvd., Glendale, Calif., LB **$404,470,** est. $430,000 (9 bidders), MUSIC BLDG., Los Angeles Valley College, Van Nuys, LOS ANGELES, CALIF. Los Angeles Bd. Educ., 1425 S. San Pedro St., Los Angeles, Calif. Bids Sept. 2. CD 8/26.

Chacksfield Constr. Co., 1346 W. 155 St., Gardena, Calif., Owner Builds, **$456,100,** 19 DWELLINGS, S. Encato Dr., Dorada and W. Cerrito Pls., Rolling Hills District, Tract 25492, PALOS VERDES ESTATES, CALIF.

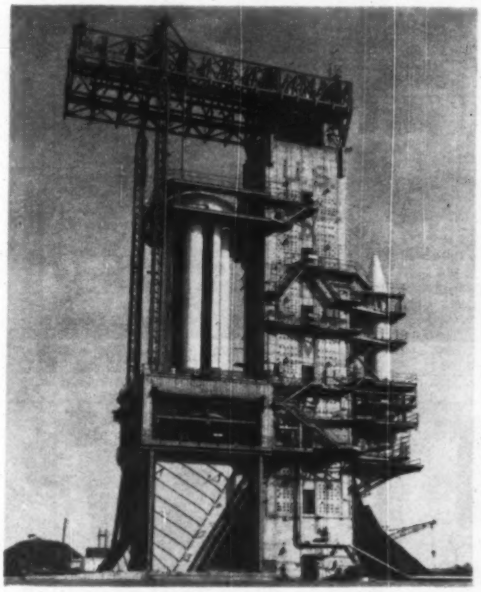
Midstate Constr. Co., 347 Clay Street, San Francisco, Calif., LB **$485,000** (6 bidders) 1 story concrete block, HIGH SCHOOL addn., Melendy Drive, SAN CARLOS, CALIF. Sequoia Union High School Dist., c/o Supt., 480 James St., Redwood City, Calif. Bids Sept. 6.

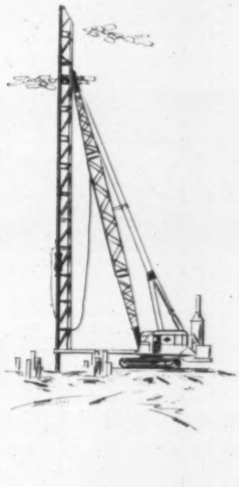
▲ **Cahill Constr. Co.**, 350 Sansom St., San Francisco, Calif., CA Est. **$7,000,000,** 23 story, APARTMENT, Nob Hill, SAN FRANCISCO, CALIF. Tishman Realty & Constr. Co., 666 5 Ave., New York, N. Y.

Peter Sartorio Contractor, 140 Reimer St., Colma, Calif. LB **$431,218,** (7 bidders), general contract, 2 story, 27,000 sq. ft. total space 400 seat DINING HALL and CAFETERIA addns., San Francisco State College, W.O. 4304GC-10, SAN FRANCISCO, CALIF. State Div. Architecture, 1120 N St., Sacramento, Calif. Bids Sept. 8. CD 8/5.

Alken Constr. Co., 333 Phelan, San Jose, Calif., CA **$514,680,** steel, wood frame, etc., Storybrook ELEMENTARY SCHOOL, SAN JOSE, CALIF. Alum Rock Union Elementary School Dist., 149 N. White Rd., San Jose, Calif. CD 7/7.

Wayne Pendergraft, Inc., P.O. Box 296, Saratoga, Calif., LB **$756,242,** (7 bidders), 27,000 sq. ft. each wood frame, stucco, Geo. C. Payne ELEMENTARY SCHOOL and Gussie Baker SCHOOL, Campbell, SAN JOSE, CALIF. Moreland Elementary School Dist., 4610





Built to withstand the thrust of our biggest missiles!

AND RESTING ON PILES DRIVEN BY C. L. GUILD

THIS is a picture of the main captive test stand at the NASA Marshall Space Flight Center, Huntsville, Alabama. And it is another example of the versatility of C. L. Guild Construction Co., Inc.

C. L. Guild drove the foundation piling immediately adjacent to and to the left of the tall square concrete structure. This new missile firing apparatus is capable of supporting our largest missiles. C. L. Guild, working for the J. A. Jones Construction Company of Atlanta, Georgia, drove: 3,000 lineal feet of 14 inch "H" piles; 2,500 lineal feet of 12 inch "H" piles; and 3,000 lineal feet of steel sheet piling.

Guild operates on a nation-wide basis. And Guild engineers, trained by experience on hundreds of the biggest construction jobs in the country, will gladly confer with you on your pile driving problems. Their experience can help you.

C. L. GUILD CONSTRUCTION CO., INC.

90 Water Street, East Providence 14, R. I.

BOSTON, MASS. WASHINGTON, D. C. HOUSTON, TEXAS
SYRACUSE, N. Y. ATLANTA, GA. KANSAS CITY, MO.

CIRCLE 219 ON READER SERVICE CARD

WORLD'S LEADING MANUFACTURER OF ADVANCED DESIGN PNEUMATIC PLACING EQUIPMENT

THE "AIR EXTRUSION" METHOD
Means Lower Concrete Costs

AIRPLACO CONCRETE PLACERS

Whether it has been used to convey or distribute structural concrete to hard-to-get-to pours, for tunnel lining, pressure grouting, for open pours, blowing sand or pea gravel backfill, or for transporting concrete to common receiving bins . . . the AIRPLACO Concrete Placer has consistently meant more concrete in place with savings in time and labor. The new "Air Extrusion" method of concrete placement gives you up to 35 cu. yds. of good concrete per hour.

AN OFFER FOR YOU! AIRPLACO's Engineering Staff is at your service. When you have a job calling for concrete, call on AIRPLACO. Through many years of experience on many types of jobs, we can help by recommending methods and techniques that will cut your costs, increase your profits. There is no obligation, of course. Write, wire or phone.

CONCRETE PLACER
CONCRETE GUNS
MIX-ELVATORS
GROUTERS
SAND BLASTERS

AIRPLACO AIR PLACEMENT EQUIPMENT CO.
1007A WEST 25TH ST • KANSAS CITY 8, MO.

CIRCLE 50 ON READER SERVICE CARD

RED STRAND
Next time get
LESCHEN
Wire Rope

LESCHEN WIRE PORTER ROPE DIVISION
H. K. PORTER COMPANY, INC.

MODERN
HY SPAR
BAR RUST
THE HARRISON PAINT and VARNISH CO.
MIDLAND INDUSTRIAL DIVISION

Ready Now

FREE CATALOG.....complete with Color Chips, Formula Facts, Application Data

SPRAY • BRUSH • DIP
Protective Coatings

CALL, WRITE for *personalized service* on YOUR "Finishing Problems"

The HARRISON
Paint & Varnish Co.
MIDLAND INDUSTRIAL DIV.
CANTON 1, OHIO

CIRCLE 52 ON READER SERVICE CARD

Strawberry Park Dr., San Jose, Calif. Bids Sept. 7. CD 8/19.

Arthur Bros., 29 Vista Ave., San Mateo, Calif., LB **$771,000**, (7 bidders), concrete block and brick POLICE STATION and JAIL, SAN MATEO, CALIF. City, City Hall, San Mateo, Calif. Alfred Johnson, 165 Jessie St., San Francisco, Calif., archt. CD 12/31.

▲ **A. L. Gindling**, 2960 Wilshire Blvd., Los Angeles, Calif., CA **$1,449,660**, 96 stucco DWELLINGS, Goleta-Sunkist Plaza, Tract 10029, SANTA BARBARA, CALIF. Allison Homes, 2960 Wilshire Blvd., Los Angeles, Calif.

Bollenbacker & Kelton, 5447 El Cajon Blvd., San Diego 5, Calif., CA **$509,976**, 50 RESIDENCES, Valley Ranches 2, SPRING VALLEY, CALIF. Davenrich, Inc., & Belfam, Inc., 5447 El Cajon Blvd., San Diego 5, Calif.

Dudley Steel Corp., 10700 Sessler St., South Gate, Calif., CA **$252,000**, 200 x 360 ft. STORAGE BLDG. addn., 19515 S. Vermont Ave., Tract 4671, TORRANCE, CALIF. Shell Chemical Corp., 20021 S. Vermont Ave., Torrance, Calif.

Kiely Corp., 12861 Palm St., Garden Grove, Calif., CA **$715,200**, 43,000 sq. ft. Victor ELEMENTARY SCHOOL, TORRANCE, CALIF. Torrance Unified School Dist., Torrance, Calif. Bids Aug. 5. CD 7/21.

▲† **O & J Constr. Co. and D. & L. Constr. Co.**, 12522 Brookhurst Ave., Garden Grove, Calif., CA **$2,458,999**, 150 units Capehart HOUSING, Marine Corps Base, TWENTYNINE PALMS, CALIF. Dist. P. Wks. Office, 11th Naval Dist., 1220 Pacific Hy., San Diego 30, Calif. Bids July 26, awarded Sept. 7. CD 7/29, under LB.

▲ **Seventh Sponsors Corp.**, 3132 S. Sepulveda Blvd., Los Angeles, Calif., Owner Builds, **$1,079,300**, six 2 story APARTMENTS, Queensland St. and Sepulveda Blvd., VENICE (LOS ANGELES), CALIF. Robert C. Lesser, 8230 Beverly Blvd., Los Angeles, Calif., archt.

CANADA

HEAVY CONSTRUCTION—BA

Ont., Toronto—BA 9/27—Municipality of Metropolitan Toronto, 67 Adelaide St. E., 10,000 ft. 27 in. Newtonbrook sewer line, Don River to Steeles Ave. $400,000. Plans deposit $50. Canadian British Engineering Consultants, 1662 Avenue Rd., consult. engrs. CD 2/17.

BUILDINGS—BA

▲ **Ont., Toronto**—SCHOOLS—BA 9/29—Bd. Educ., 155 College St., concrete frame, masonry exterior, etc. Davisville Public School and Metropolitan School for the Deaf. $1,200,000. Plans deposit $50. CD. 9/30/59.

▲ **Que., Montmagny**—Bid Asked—School Bd. of Montmagny, Montmagny, 3 story, 365x55 ft. and 42x42 ft. rein.-con. frame, brick college, Trans-Canada Rd. $1,250,000. Former contract cancelled. CD 4/6, under CA.

HEAVY CONSTRUCTION—LB & CA

BRITISH COLUMBIA—B.C. Govt., Parliament Bldgs., Victoria,

Columbia Bitulithic Ltd., Granville Island, Vancouver, B.C. LB **$220,322** (7 bidders), bit. surf. 10.54 mi. Trans-Canada Hy., Chilliwack District. Bids Aug. 23. CD 8/12.

A. K. Penner, Steinbach, Man. LB **$262,111**, Fairford River Diversion Channel involving drainage excav. for 8,300 ft. and 2 coffer-dams, Grahamdale, MANITOBA. Manitoba Dpt. Agriculture & Conservation, Room 165, Legislative Bldg., Winnipeg 1, Man.

ONTARIO—Ontario Dpt. Hys., Parliament Bldgs., Downsview, Bids opened 8/31,

Brennan Paving Co. Ltd., 400 Gage Ave. North, Hamilton, Ont., LB **$166,801**, hot mix paving, grading, drainage, 5.86 mi. Hy. 15, Elgin to Morton, Proj 60-189. CD 8/11.

Renzetti Constr. Co. Ltd., 282 Geary St., Toronto, Ont., LB **$230,231**, 4,000 lin. ft. storm sewers and 4,000 lin. ft. open ditch, RICHMOND HILL, ONT. Town, Town Hall Municipal Bldg., Richmond Hill, Ont. Proctor & Redfern, 75 Eglinton Ave. E., Toronto, Ont., engrs.

Carrier Air Conditioning & Refrigeration, 100 Advance Rd., Toronto, Ont., LB **$163,900**, refrigeration machines, power plant, International Air Terminal Bldg., TORONTO, ONT. Dpt. Transport, Hunter Bldg., Ottawa, Ont. CD 9/8.

Robert McAlpin Ltd., P. O. Box 249, Weston, Ont., CA **$794,808**, grade separation, Islington Ave. to C. P. R. right of Way at Cordova Ave., Contr. 60-21, TORONTO, ONT. Etobicoke Twp., 550 Burnhampton Rd., Toronto, Ont. Awarded Aug. 29. (**Correction**—owner). CD 8/24.

Derourdy Constr. Ltd., 3350 Laurier St., Lafleche, Que., LB **$233,564**, (9 bidders), 12,700 lin. ft. 6- to 10-in. c.i. water mains, ST. BASILE LE GRAND, QUE. Municipality of St. Basile Le Grand, Que. CD 8/18.

BUILDINGS—LB & CA

▲ **Smith Bros & Wilson Ltd.**, 1267 Richards St., Vancouver, B. C., LB **$3,057,352**, 3 and 5 story, full bsmnt., T shaped 48x221 ft. and 134x214 ft. rein.-con. brick bladding HOSPITAL, NANAIMO, B. C. Nanaimo General Hospital Bd., Nanaimo, B. C. Read Jones & Christoffersen, 1161 Melville St., Vancouver, B. C., engrs. Bids Aug. 31. CD 8/4.

▲ **A. R. Grimwood Ltd.**, 1129 Kingsway, Vancouver, B. C. CA **$1,358,294**, 8 story, rein.-con. NURSES RESIDENCES and TRAINING SCHOOL, NEW WESTMINSTER, B. C. Royal Columbia Hospital, 330 E.

Columbia St., New Westminster, B. C. Bids Aug. 23, awarded Sept. 1. CD 9/9.

Anglin-Norcross (Western) Ltd., 1157 Melville St., Vancouver, B. C., CA **$608,637**, CHEMICAL ENGINEERING BLDG., VANCOUVER, B. C. University of British Columbia, Vancouver, B. C. Chouklos Woodburn Hooley & McKensie Ltd., 1158 W. Broadway, Vancouver, B. C., engrs. Bids Aug. 9, awarded Sept. 1. CD 8/30, under LB.

▲ **Angus Robertson Ltd.**, 57 Bloor St. W., Toronto. CA Est. **$2,500,000**, (17 bidders), 100,000 sq. ft. 5 story, structural steel, etc. University of Toronto MUSIC BLDG., Queens Park, TORONTO, ONT. University of Toronto, Simcoe Hall, Toronto, Ont. Bids Aug. 30, awarded Sept. 6. CD 8/23.

Benjamin Robidas Ltee, 164 Moulin St., Drummondville, Que., CA **$140,000**, (8 bidders), 2 story, 144 x 240 ft. steel frame, masonry WAREHOUSE EXTEN., DRUMMONDVILLE, QUE. Dennison Mfg. Co., 271 St. George St., Drummondville, Que. Bids Aug. 23. CD 8/19.

Monarch Constr. (Quebec) Ltd., 278 Nassau St., Beaconsfield, Que., Owner Builds, **$525,000**, HOUSING, Forest Gardens, stone, brick and wood walls, concrete fdns., MONTREAL, QUE.

U. S. POSSESSIONS

HEAVY CONSTRUCTION—BA

▲† **Canal Zone**—AIRPORT IMPRVTS.—BA 10/20—U. S. Eng., P. O. Box 4970, Jacksonville, Fla., U. S. A., runway, taxiway, apron paving and lighting, Howard Air Force Base, ENG-08-123-61-23. $1,500,000. CD 9/9.

HEAVY CONSTRUCTION—LB & CA

▲ **Miller Constr. Co.**, Muskogee, Okla., LB **$578,050**, Est. $782,000, (7 bidders), c.i. water main, from Muralfores Filter Plant to Corozal, CANAL ZONE. Engineering & Constr. Dir., Panama Canal Co., Balboa Heights, Canal Zone. Bids Aug. 15, CD 6/16;
Bildon, Inc., Curundu, Panama, LB **$515,916**, prestressed water main, Muraflores-Corozal (Canal Zone).

Ed. Brunet & Sons Ltd., 9 Dumas St., Hull, Que., LB **$446,574**, POLICE STATION, St. Joseph's Blvd., HULL, QUE. City. City Hall, Hull, Que. CD 2/16/59.

AMERICANS ABROAD

HEAVY CONSTRUCTION—BA

† **West Indies, Barbados**—TERMINAL BLDG. ADDNS.—BA 10/6—Area P. Wks. Office, Caribbean, U. S. Naval Station, San Juan, Puerto Rico, addns. to terminal bldg., U. S. Naval Facility, Contr. NBy-18027 Spec. No. 18027/60. Under $25,000.

HEAVY CONSTRUCTION—LB & CA

† **Vanguard Constr. Corp.**, 369 Lexington Ave., New York 17, N. Y., CA **$254,704**, Constr. Trident Bldg. U. S. Naval Station, Tudor Hill, IFB NBy 31987, BERMUDA. P. Wks. Officer, New York, 90 Church St., New York 7, N. Y. U.S.A. CD 8/19.

BUILDINGS—LB & CA

▲ **Bechtel Corp.**, 485 Lexington Ave., New York, N. Y., U.S.A., will engineer and supervise construction,
Rella, Vienna, Austria will construct, CA est. **$10,000,000**, 13 story HOTEL, GARAGE and SKATING RINK, Johannesgasse, Heumarkt and Lothringerstrasse. VIENNA, AUSTRIA. General Hotel Co. of Austria, Vienna, Austria. Intercontinental Hotels, New York, N. Y., U.S.A., will operate. CD 2/16.

PROPOSED PROJECTS

WATER SUPPLY

Ala., Greenville—City, City Hall, water distr. lines, **$225,000**. Donald Mills, 504 Tremont St., Selma, engr.

Hawaii, Honokahau—Bd. Water Supply, 630 S. Beretania St., Honolulu, Honokahau water sys., storage reservoir, transmission line from Waiaha to Honokahau resort. **$994,000.**

Tex., Big Spring—City, City Hall, bond election Sept. 13, water mains, **$375,000**; WW imprvs., **$200,000**; elev. water storage, **$80,000.**

▲ **Tex., Odessa**—City, City Hall, bond election Oct. 4, water filtration plant, **$1,100,000**; pumping station, **$170,000**; mains, **$300,000.** CD 8/17.

▲ **N. B., Lancaster**—Dpt. P. Wks., Parliament Bldgs., Fredericton, water pipe line. **$1,090,469.**

Que., Les Saules—Ville de Les Saules, Que. water mains, water purification system, sewers, etc. **$250,000.** Raoul Girard, 2051 Dickson St., Sillery, consult. engr.

SEWERS, WASTE DISPOSAL

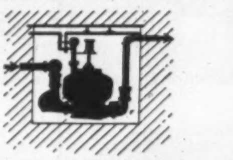
Conn., Wallingford—Town, Town Hall, sewer laterals, Ridgeland, Colonial Manor and Parkview, **$500,000.**

Ill., Danville—City, City Hall, sanitary sewers, 14th St., **$237,000**, Warren & Van Praag, 253 Park St., Decatur, consult. engrs. CD 1/26/56.

Kan., Sabetha—City, City Hall, (P-Kans-3024) sewer imprvs. **$221,000.** Wilson & Co., 631 E. Crawford, Salina, consult. engrs.

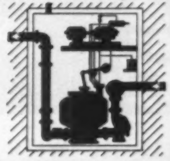
Which sewage lift station is best for your job?

TOPS IN DEPENDABILITY AND SAFETY



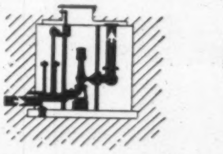
Concrete or steel underground station with Shone® Type S pneumatic ejector, mechanically controlled (warranted 25 years). Remote air supply. Nothing electrical; maintenance free, operates even under water. For municipalities and large subdivisions.

SURPRISINGLY VERSATILE, INEXPENSIVE



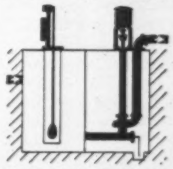
Shone® Type SAC station, underground in concrete vault. Mechanically controlled ejector (warranted 25 years) has its own compressor. Frequently less costly than package stations. Finds use everywhere.

PACKAGE STATION



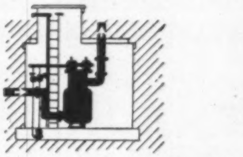
Quality underground station with vertical, short-coupled (Series 6260), dry pit centrifugal pumps. Quality design and equipment give good service life at nominal cost. For small permanent stations, growing areas.

LOW FIRST COST—EASY INSTALLATION



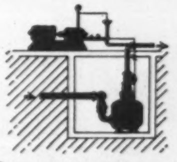
Two-compartment steel basin with centrifugal vertical wet pit pump. Pumps are not submerged; motors protected from flooding. Low first cost; fast installation. For buildings, small growing subdivisions.

ULTIMATE IN PACKAGE DESIGN



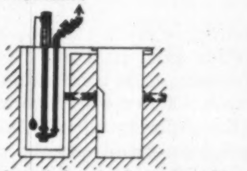
Package underground station with Expelsor® pneumatic ejector, electrode controlled. Sanitary and dependable, low maintenance, easy to service. Recommended for municipal and subdivision applications.

BUILDING TYPE STATION



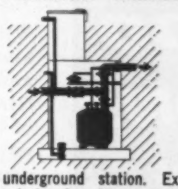
Expelsor® pneumatic ejector station designed for use in buildings. Compressor is on basement floor; ejector on floor below. Sealed installation gives safe, odorless handling of sewage indoors.

SPECIAL PROBLEMS?



Centrifugal vertical wet pit pumps with adjoining settling basin. Good for areas where sand or old sewers create problems. Special pump construction for abrasive or corrosive conditions, industrial wastes.

MAXIMUM RELIABILITY—MINIMUM SPACE



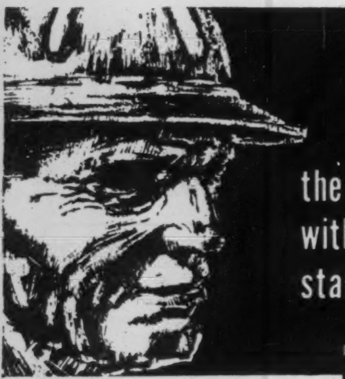
Package underground station. Expelsor® pneumatic ejector has two compartments, duplex compressors and controls. Excellent service accessibility. Especially suited for subdivision and municipal lift stations.

L-5911

The answer depends on the job. Is it to be a temporary station? What about future loads? How much maintenance will it get? What type of power is available? These and many other questions must be weighed carefully and without bias. In making the decision, why not put Yeomans 61 years' experience (59 on underground stations alone) to work? Because Yeomans builds **the only complete line** of sewage lift stations in the industry, recommendations are **impartial** and in your best interest. Phone, wire, or write now.

YEOMANS
1999-1 North Ruby Street,
Melrose Park, Illinois

SPECIALISTS IN SEWAGE LIFT STATIONS—THE COMPLETE LINE



the man who backs his skill with Mobile Drill has a head start on any job he wants!

Hydraulic-powered, multi-purpose B-40 EXPLORER owned by Testdrill Inc. has given over 500 hours of continuous, maintenance-free operation.*

B-40 DRILLS 110′ WITH 4″ AUGERS, MAKES 15 PENETRATION TESTS EACH EIGHT HOURS

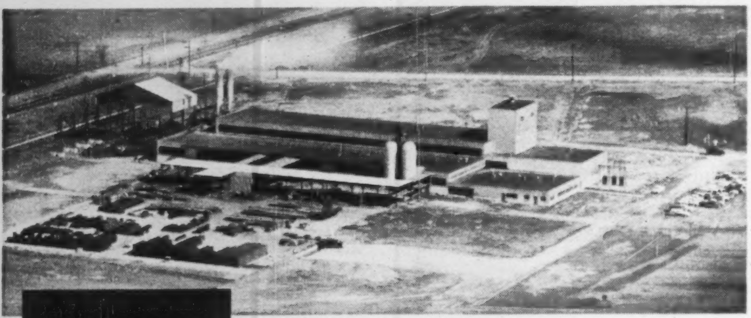
"Foundation testing job for the Air Force Academy was completed rapidly and economically," says Jack W. Shy, Field Engineer of Testdrill Inc., Colorado Springs, Colorado. "Split-spoon samples were taken every 6′ to about 70′ depths in Dawson-Arkose (90 to 100 blows per foot with 140 lb. hammer)."*

*Write today for your copy of Case History No. 1960-3.

MOBILE DRILL

MOBILE DRILLING, INC.
Dept. 31 • 960 N. Pennsylvania St.
Indianapolis, Indiana

CIRCLE 55 ON READER SERVICE CARD



500 TONS OF CASTINGS DAILY!

With the recent opening of plant #2, shown above, our production potential of Gray and Ductile Iron Construction and Industrial Castings has now reached a maximum of 500 tons daily. This capacity, plus 15,000 patterns, plus a good on-hand supply of standard castings, plus 90 years experience in the business, is your assurance of prompt delivery, superior quality, complete uniformity and practical economy.

* * *

New and fully illustrated 168-page catalog of construction castings will be sent promptly upon request.

NF

NEENAH FOUNDRY COMPANY
NEENAH • WISCONSIN
Chicago Office: 5445 North Neva Avenue, Chicago 31, Illinois

Mass., Ayer—Town, Dpt. P. Wks., Town Hall, sewer pumping station and force main. **$617,000.** Camp, Dresser & McKee, 18 Tremont St., Boston, engrs. Constr. 1960.

Minn., Eagle Lake—Village, Village Hall, voted **$196,000** bonds Aug. 5, sanitary sewerage sys., sewer disposal plant. Carter, Krueger & Assocs., 3381 Gorham Ave., Minneapolis, consult. engrs.

▲ **Mo., St. Louis County**—Metropolitan St. Louis Sewer Dist., 2000 Hampton Ave., voted **$10,986,000** bonds Aug. 30, major trunk sewerage sys., sewage treatment facilities involving 8 to 10 mi. sewers, etc. Coldwater Creek Watershed. CD 8/9.

▲ **Mo., St. Louis County**—Metropolitan St. Louis Sewer Dist., 2000 Hampton Ave., St. Louis 1, voted **$4,750,000** bonds Aug. 30, sanitary trunk sewers, Gravois Creek Subdistrict, Gravois Creek Watershed, southern part of county. CD 8/9.

▲ **Neb., Omaha**—City, Dpt. Sewers, City Hall, bond election Nov. 8, sewage treatment plant. **$10,700,000.** CD 12/10/58.

▲ **N. Y., Fulton**—City, City Hall, sewerage system and treatment plant, **$1,500,000.** Alvord, Burdick & Howson, 20 N. Wacker St., Chicago, Ill., engrs. Constr. 1961.

O., Maple Heights—City, City Hall, storm sewers in Rockside-Dunham-Glenwood area. **$300,000.** H. P. Peterson, 5250 Northfield Rd., Cleveland, consult. engr.

Okla., Duncan—City, City Hall, outfall sewer and disposal plant. **$600,000.**

Pa., Gilbertsville—Comrs. Douglas Twp., sewage treatment plant, **$687,600.** Mast Engineering Co., Inc., 325 Washington St., Reading, engr.

▲ **Tex., Big Spring**—City, City Hall, bond election Sept. 13, sewage disposal plant, **$1,050,000.** Forrest & Cotton, 600 Vaughn Bld., Dallas, consult. engrs. A. K. Steinheimer, city engr. CD 5/19.

Tex., Odessa—City, City Hall, bond election Oct. 4, sanitary sewers, **$441,000;** sewage disposal unit, **$150,000.** CD 8/18.

Vt., Proctor—Village, Village Hall, Main St., sewage disposal plant, **$500,000.** J. Kenneth Fraser, 516 Washington Ave., Rensselaer, N. Y., consult. engr Constr. 1961. CD 6/6.

▲ **Wis., Appleton**—City, City Hall, sewage treatment plant, **$1,000,000.** Greeley & Hansen, 220 E. State St., Chicago, Ill., consult. engrs. CD 12/16.

BRIDGES

▲ **OHIO**—State Dpt. Hys., State Depts. Bldg., Columbus, Zone 15,

Butler Co.—Columbia St. Bridge, **$1,500,000.** Hazelet & Erdal, Dixie Terminal Bldg., Cincinnati, consult. engrs. CD 7/20.

STREETS AND ROADS

Ark., Camden—City, City Hall, (P-Ark-3020) paving various streets, **$624,500.**

Colo., Gunnison—City, City Hall, curbs, gutters, sidewalks, streets and drainage imprvs. **$844,000.** To go ahead 1960.

HAWAII—State Hy. Dpt., 465 So. King St., Honolulu, two lane hy. 3.5 mi. from Kalua-Kina to Honokahua resort. **$603,000.**

▲ **MICHIGAN**—State Hy. Dpt., 732 Mason Bldg., Lansing,

Alpena and Presque Isle Counties—reconstr. about 14 mi. M-65. **$1,098,000.** Bids in December.

Tex., Big Spring—City, City Hall, bond election Sept 13, street paving, imprvs., **$900,000.**

Tex., El Paso—El Paso County, Courthouse, P-Tex-3083, road imprvs., incl. 5- interchange connecting roads, **$500,000.** Smith & Gremans, 1629 Montana, consult. engrs.

Tex., Longview—City, City Hall, street paving, **$623,000.** Brown & Root, Inc., 1st. Nat'l. Bank Bld consult. engrs. CD 10/28.

EARTHWORK, WATERWAYS

▲ **California**—Santa Clara Valley Water Conservation Dist., c/o Secy., 15420 Almaden Rd., San Jose, cross-valley pipe line 72-in. diam., from Anderson Reservoir to Los Gatos Creek. Irrigation system for Morgan Hill area, pipe line from Coyote Creek to Pentencia Pond, canals, fence. **$12,700,000.**

▲† **Michigan**—U. S. Eng., 1101 Washington Blvd., Detroit, Zone 31, dredging West Approach to Locks, St. Marys Falls Canal, St. Marys River, CIVENG-20-064-61-10. Under **$2,000,000.**

Tex., Big Spring—City, City Hall, bond election Sept 13, flood control, **$575,000.**

Tex., Odessa—City, City Hall, bond election Oct. 4, open drainage channel, **$510,000.**

AIRPORTS

† **Ga., Albany**—SAC AIR LAUNCH MISSILE FACILITY—U. S. Eng., 200 E. St. Julian St., Savannah, SAC air launch missile facility, Turner Air Force Base, **$850,000** (funds released).

UNCLASSIFIED

† **D. C., Wash.**—TOWER BLDG.—U. S. Eng., 1st and Douglas Sts. N. W., tower building, modification, 2

sites, Washington Defense Area, **$500,000-$1,000,000,** barracks modification, 3 sites, Washington Defense Area, **$50,000-$100,000.**

Hawaii, Honokahau—MARINA—State of Hawaii, 465 S. King St., Honolulu, Honokahau marina, berthing facilities, breakwater, waterfront imprvs., utilities, buildings and access road. **$710,000.**

Iowa, Council Bluffs—Municipal Park Bd., City Hall, L-shaped 60 x 165 ft. swimming pool, diving section, wading and junior pools, bathhouse, etc. **$216,000.** Kenneth H. Larkin & Assocs., 19 E. Gregory Blvd., Kansas City, Mo., consult. engrs. CD 11/19.

Louisiana—GAS SUPPLY LINES—Texas Gas Transmission Corp., Box 577, Owensboro, Ky., 18 mi. 10 in. gas line, Thibodaux to Bayou Chevreuil field. **$335,000.**

N. J., Trenton — STADIUM — Bd. Freeholders Mercer County, Court House, plans by Peter Carver Assocs., 70 E. 45 St., New York, N. Y., stadium, South Broad St. **$543,600.** CD 6/5/57.

▲ **N. Y., Flushing**—OASIS—Liebmann Breweries, Inc., 36 Forrest St., Brooklyn, Zone 6, plans by Kahn & Jacobs, 2 Park Ave., New York, Zone 16, 80 ft. high "Oasis" for 1964-65 Worlds Fair. **$2,000,000.**

Texas—PARK—State Park Bd., Main State Admin. Bldg., Austin, San Marcos State Park, New Braunfels (18 mi. north). **$400,000.**

Tex., Big Spring—PARKS—City, City Hall, bond election Sept. 13, parks. **$400,000.**

Va., Fredericksburg—GAS DISTRIBUTION LINES—Natural Gas Service Co., Fredericksburg, gas distr. lines. **$292,000.**

▲ **Ont., Burlington**—GOLF COURSE—Owner, c/o William R. Souter & Assocs., archts., 36 James St. S., Hamilton, golf course, upper Brant St. **$1,500,000.**

Que., Quebec City—ARENA—City, City Hall, plans by Maurice Mainguy, 1510 Chemin Ste. Foy, 20x30x225 ft. structural steel frame arena addn., Victoria Park. **$600,000.**

PUBLIC BUILDINGS

Calif., Covina—SCHOOL—Covina Valley Unified School Dist., 19009 E. Badillo St. Plans by Maul & Pulver, 245 W. Badillo St. 1 story, 29,156 sq. ft. elementary school, Manzanita, West Covina. **$500,000.**

Calif., Newark—SCHOOL—Newark Elementary School Dist., c/o Supt., 2750 Thornton Ave., plans by Falk & Booth, 16 Beale St., San Francisco, Snow Elementary School in Lido Faire Tract. **$546,380.**

Conn., Bridgeport—SCHOOL—Town, Bd. Educ., 171 Harrison St., elementary school, Thorne St. **$400,000.**

Conn., New Haven—FIRE HEADQUARTERS—City, City Hall, plans by Carlin & Millard, 427 Temple St., fire headquarters, Olive St. **$500,000.**

▲ **Conn., Storrs**—SCHOOL—State P. Wks. Dpt., 165 Capitol Ave., Hartford, plans by Robert May, c/o Perkins & Will, 55 Church St., White Plains, N. Y., Veterinary Science School, University of Conn., **$2,000,000.** CD 3/12/59.

Conn., West Hartford—GARAGE—Town, Town Hall, plans by Louis J. Drakos, 998 Farmington Ave., public works and maintenance bldg. garage. **$350,000.** CD 8/18.

▲ **Del., Dover**—STATE PRISON—Delaware State Bd. Corrections, Greenbank Rd., Wilmington, Central State Prison. Over **$1,000,000.**

▲ **Del., Georgetown**—HIGH SCHOOL—Delaware State Bd. Educ., State House, Dover, plans by Dollar, Bonner, Blake & Manning, 110 Madison St., Wilmington, Vocational High School, at Nanticoke Hundred, **$1,125,000.** Louis H. Doane & Assocs., Penna. R.R. Bldg., Wilmington, engrs.

▲ **Ga., Atlanta**—SCHOOLS—City Bd. Educ., City Hall, plans by Heery & Heery, 1366 Peachtree St. N.E., elementary school, Ashby St., **$500,000;** plans by Toombs, Amisano & Wells, 70 Fairlie St. N.W., Harper High School, **$600,000.** CD 4/30/57.

Ga., Moultrie—TRADE SCHOOL—City Bd. Educ. and Colquitt County Bd. Educ., Moultrie, plans by William P. Thompson Jr., P.O. Box 2187, Macon, Trade School. **$400,000.**

▲ **Hawaii, Ft. Armstrong**—CLINIC—State of Hawaii, 465 S. King St., Honolulu, U. S. Public Health Clinic, and quarantine station on two acres site. **$1,900,000.**

Ill., Lake Forest—HOUSING, etc.—Leander J. McCormick Estate, 332 S. Michigan Ave., Chicago, Zone 4, plans by Stanley Anderson & Assocs., 270 E. Deerpath Rd., 3 story housing and stores, 580 Bank Lane. **$450,000.**

▲ **La., Abbeville**—HOSPITAL—City, City Hall, plans by L. Jaco LeBlanc & Assn., Box 3166, Lafayette, La., hospital, **$1,500,000.**

Mass., Brookline—HOUSING—Town of Brookline, Housing Auth., 226 High St., plans by Isidor Richmond & Carney Goldberg, 16 Arlington St., Boston, 100 units, PH Mass., 3-11 housing project, **$1,000,000.** Bid soon.

▲ **Mass., Wilmington**—INTERMEDIATE SCHOOL—Town, Town Hall, Supt. Schools, Wilmington, plans by Valtz & Kimberley Inc., 1 Salem St., Malden, Intermediate School, North Wilmington section, Salem and Ballardvale Sts. **$1,000,000.** Constr. 1961.

▲ **Minn., Rochester**—SCHOOL—Bd. Educ. plans by Ellerbe & Co., 333 Sibley St., St. Paul, Junior High School. **$1,500,000.** Constr. 1961. CD 10/5.

▲† **Minn., St. Paul**—POST OFFICE IMPRVS., etc.—General Services Admin., 2306 E. Bannister Rd., Kansas City, Mo., plans by Ellerbe & Co., 333 Sibley St., and Cavin & Page, 360 Robert St., remodeling 6 story penthouse, post office, 180 E. Kellogg Blvd. **$8,000,000.** To go ahead Aug. 1961. CD 11/9/55.

N. H., Dover—INDUSTRIAL ADDN.—State, Industrial Park Auth., Planning & Development, State House Annex, Concord, industrial bldg. addn. **$400,000.** Blasko & Moore, 159 Myrtle St., Medford, Mass., consult. engrs. Constr. 1960.

▲ **N. J., Riverton**—SCHOOLS—Cinnaminson Twp. Bd. of Educ., Riverton, plans by Thomas J. Malone, 919 Broadway, Westville, high school and elementary school. **$2,000,000.**

▲ **N. Y., Dunkirk**—SCHOOLS—Dunkirk Bd. Educ., bond election Oct. 10, high school and school addns. **$2,500,000.** CD 3/30.

▲† **N. Y., Islip**—HEADQUARTERS—Federal Aviation Agency, 347 Federal Bldg., New York International Airport, Jamaica, headquarters for New York Air Route Traffic Control Center, MacArthur Field at Johnson Ave. and Veteran's Memorial Hy. **$1,500,000.** Seelye Stevenson, Value & Knecht, 101 Park Ave., Zone 17, engrs. Bids September-October.

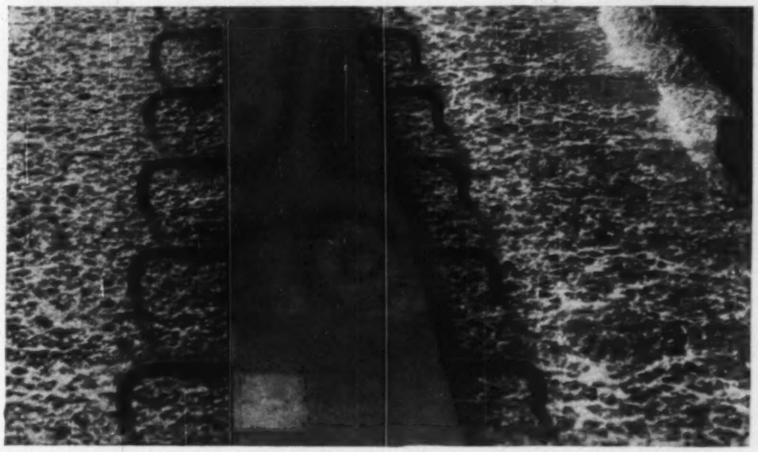
▲ **N. Y., New York**—DORMITORIES, etc.—Dormitory Auth. of New York State, State Office Bldg., Albany, plans by Ballard, Todd, Snibbe, 123 E. 77 St., Zone 21, dormitories and mess hall for Maritime College, Fort Schuyler. **$3,110,000.** Peter W. Bruder, 200 E. 37 St., Zone 16, engr. CD 3/26/57.

▲† **N. Y., New York**—CUSTOMS COURT, etc.—General Services Admin., 250 Hudson St., Zone 13, plans by Kahn & Jacobs, 2 Park Ave., Zone 16, Alfred Easton Poor, 400 Park Ave., Zone 22, and Eggers & Higgins, 100 E. 42 St., Zone 17, Customs Court and 41 story Federal Office, Foley Square Area bounded by Lafayette, Worth and Duane Sts. **$70,000,000.** Jaros, Baum & Bolles, 415 Lexington Ave., New York 17, N. Y., structural engrs. Severud, Elstad, Krueger, 415 Lexington Ave., New York 17, N. Y., mechanical engrs. CD 12/11/58.

▲ **N. C., Zebulon**—HOUSING—Wake County Housing Auth., Robert D. Massey, chn., Zebulon, plans by John J. Rowland, 129 W. Gordon St., Kingston, 112 housing units. **$1,000,000.** Cofer, Rouse & Jeglinski, 1023 Arnold St., Greensboro, consult. engrs. CD 5/31.

▲ **O., Columbus**—HIGH SCHOOL—Hamilton Twp. Bd. Educ., Lockbourne Rd., plans by Kellam & Foley, 1621 W. 1st St., high school. **$1,019,000.**

▲ **O., Findlay**—HIGH SCHOOL—Bd. Educ., bond election Nov. 8, high school, **$4,800,000.** Perkins & Will, 309 W. Jackson St., Chicago, Ill., archts. CD 7/12.



New! Dorr-Oliver

INKA AERATION SYSTEM

The first truly different approach to activated sludge aeration in the last 30 years

A high turbulence bubble zone provided by corrosion proof, clog-resistant aeration grids of radically new design now makes possible greatly increased oxygen absorption rates for more efficient biological treatment of sewage and industrial wastes by the activated sludge process.

The D-O INKA system is an exclusive development, based on a new principle of operation. It not only offers higher oxygenation capacities but also high circulating velocities that promote optimum mixing conditions. Simple, low pressure fans are used rather than conventional blowers. No air filters are required. Oxygen transfer rates from 10 ppm to 150 ppm per hour and higher are feasible. Power costs range from 0.20 Kwh to 0.45 Kwh per pound of oxygen dissolved, depending on transfer rates. Construction and maintenance costs are low. For full details, write for Bulletin No. 7317 to Dorr-Oliver Incorporated, Stamford, Connecticut.

At the WPCF Convention . . . Visit D-O booth #219-221
to see an operating demonstration of this new System.

DORR-OLIVER
WORLD-WIDE RESEARCH • ENGINEERING • EQUIPMENT

CIRCLE 223 ON READER SERVICE CARD

SEAGOING MISSILE LAUNCHER

Precise installation of this missile launcher for the Polaris program is representative of the work successfully completed by P. C. & R. For many years P. C. & R. has performed precision equipment installation for various branches of government and industry.

Pacific Crane & Rigging Co. Mechanical Constructors

PACIFIC CRANE & RIGGING CO.

6855 E. Rosecrans Ave., Paramount, Calif., NEvada 6-9213—MEtcalf 0-6020

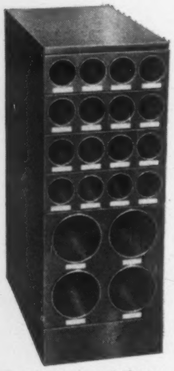
EQUIPMENT SETTING • MECHANICAL PIPING • CRANE SERVICE • MISSILE EQUIPMENT • POLE RIGGING • JACK & ROLLER RIGGING • SPECIAL PROJECTS

CIRCLE 56 ON READER SERVICE CARD

PLAN HOLD® VERTICAL AND ROLL FILING EQUIPMENT

for big plans, prints, drawings, or little stencils, negs, art work

Mobile like this Rolling Stand. Also wall-mounted, portable and cabinets.



Stack 'em as you want them . . . with small or large tubes up to 5' long.

Speed use, cut overhead, save space because PLAN HOLD files are engineered for efficiency. Made of steel and aluminum for rugged use. In modular sizes to meet your exact needs. See them at your engineering supply or office equipment dealer. Or write direct for catalog and prices.

PLAN HOLD CORPORATION Dept. 6

5204 Chakemco St., South Gate, Calif.

O., Greenhills — SCHOOL — Greenhills Exmpt. Village School Dist., Greenhills, plans by Garriott & Becker, 2414 Grandview, Cincinnati, school addn., alterations. **$570,000.** CD 5/9.

▲ **Pa., Middletown** — SCHOOL — Middletown Area Jt. School Dist. plans by Poor & Loddengaard, 1601 N. Front St., Harrisburg, Pa., Junior-Senior High School. $1,800,000. Bids 1961. CD 12/3/58.

▲ **S. D., Brookings**—HOSPITAL—City, City Hall, $330,000 bond election Sept. 27, 60 bed hospital, **$1,250,000.** Ellerbe & Co., 333 Sibley St., St. Paul, Minn., archts. CD 2/5.

▲ **Tenn., Columbia**—SCHOOL—Maury County Bd. Educ., plans by Clemmons & Gingles, 1900 Division St., Nashville, 110,000 sq. ft. Central High School, **$1,000,000.** CD 7/13/59.

▲ **Tex., Austin** — HOSPITALS — Board for Texas State Hospitals & Special Schools, 4405 Lamar Blvd., 1,000 senile mental hospital, **$5,000,000;** 600-bed mentally retarded hospital, **$4,000,000.** CD 11/25/55.

Tex., El Paso—PARK IMPRVS.—El Paso County, Courthouse, P-Tex-3084, park imprvs., incl. renovation, Ascarate Park. **$880,000.** Smith & Cremans, 1629 Montana, consult. engrs.

Tex., Ennis—HOSPITAL—City, City Hall, voted $350,000 bonds, Aug. 27, city hospital, **$750,000.** CD 8/19.

Tex., Midland—SCHOOL—Midland Ind. School Dist., Midland, plans by Pierce, Norris, Pace & Assoc., 1002 West Wall St., masonry elementary school, **$450,000.** CD 11/12.

Tex., Odessa—CITY HALL—City City Hall, bond election Oct. 4, city hall, **$900,000.** CD 6/21.

Va., Princess Anne—SCHOOL—Princess Anne Co. School, Bd., Courthouse, plans by King & Reiff, 811 W. 21st St., Norfolk, 1 story, 40,000 sq. ft. Northwest Elementary School, **$600,000.** CD 6/17.

▲ **Wis., Stevens Point**—SCIENCE—Bd. Regents of State College, Madison, science bldg. **$1,000,000.**

▲ **Man., Lac du Bonnet** — PLANT — Atomic Energy of Canada Ltd., 150 Kent St., Ottawa, Ont., plans by Moody, Moore & Partners, 295 Broadway Ave., Winnipeg, Nuclear Research plant, 10,000 acre site, east bank of Winnipeg River. **$50,000,000.** Shawinigan Engineering Co., Ltd., 600 Dorchester St. W., Montreal, Que., consult. engrs.

▲ **Que., Asbestos**—SCHOOL—Provincial Department of Youth, Parliament Bldgs., Quebec City, plans by Philippe Demers, 1206 Dominion St., Sherbrooke, Arts and Trades School, Manville St., **$1,000,000.** CD 4/13/56.

COMMERCIAL BUILDINGS

Ark., Little Rock—OFFICE—National Investors Life Insurance Co., 124 Main, 4 or 5 story, 30,000 sq. ft. office. **$600,000-$750,000.**

▲ **Calif., Dairy Valley**—DWELLINGS—Emblem Homes, Inc., 8906 W. Olympic St., plans by Edward E. Carver, 7521 3 St., Downey, 237 dwellings in The Artesia District. **$3,436,500.**

▲ **Calif., Huntington Beach**—DWELLINGS—Robert A. Grant Developers, 1665 S. Brookhurst St., Anaheim, 123 dwellings, Smeltzer St. and others. **$1,542,912.**

▲ **Calif., Van Nuys**—DWELLINGS—Pyrenees Co., 7805 Sunset Blvd., Los Angeles, plans by L. C. Major & Assoc., 11015 S. Paramount Blvd., Downey, 78 frame, stucco dwellings, Tract 25276, **$1,105,000.**

Calif., Van Nuys—DWELLINGS—Roscoe Manor, 5656 W. 3 St., Los Angeles, Zone 36, 44 frame, stucco dwellings. Tract 24174. **$646,800.**

▲ **Colo., Aurora**—HIGH SCHOOL—School Dist. 28-J, 1085 Peoria, plans by Atchinson, Kloverstrom, Saul & Atchison, 257 Josephine St., Denver, 1 story, 87,258 sq. ft. South Junior High School, **$1,300,000,** Bids about 10/1.

Conn., Stratford—HOUSES—David Williams, Inc., 144 Meadowmere Rd., 70 houses, "Wilbar Park," Huntington Rd., Putney, **$1,400,000.**

Conn., Wallingford—BANK—Union & New Haven Trust Co., 205 Church St., New Haven, plans by Andrew F. Euston, 153 Court St., New Haven, 2 and 3 story, bank, N. Main St. **$400,000.**

Fla., Cocoa Beach—APARTMENT—William Murphy, Jr., Orlando, c/o Carlisle & Dorsey, archts., 47 E. Robinson Ave., Orlando, concrete frame, multi story 120-unit apartment, swimming pool, **$750,000.**

Fla., Sarasota—STORE—W. C. Harris & Co., Winder, Ga., Department Store, **$500,000.** J. C. Penney Co., lessee.

▲ **Ga., Atlanta** ADMINISTRATIVE, etc.—The Westminister School, 1424 W. Paces Ferry Rd., plans by Francis M. Daves, 57 8th St. N. E., 77,000 sq. ft. administrative-activities building, **$1,125,000.** Armstrong & Edwards, 26 Peachtree Place N. W., consult engrs. CD 3/3.

▲ **Hawaii, Kahului**—CO-OPERATIVE APARTMENTS—Kahului Development Co. and Johnson-Pacific Constr. Co., Maui, seven 3-story co-operative apartments. **$1,000,000.**

Hawaii, Makaha—SHOPPING CENTER—Joe Cornet, 620 California Ave., Honolulu, Waianae-Makaha shopping center. **$750,000.**

Idaho, Moscow—HOSPITAL—Moscow Hospital Assn., Moscow, plans by Whitehouse & DeNeff, 715 Hutton Bldg., Spokane, Wash., 4 story Gritman Memorial Hospital addn. **$640,000.** Bid soon, CD 1/25.

Ill., Chicago—APARTMENTS—Draper & Kramer & Syndicate, 30 W. Monroe St, Zone 3, plans by Lowenberg & Lowenberg, 120 S. La Salle St, Zone 3, three tower apartments, 49th St., and Chicago Beach Drive, **$20,000,000.**

▲ **Ill., Chicago**—OFFICE—Home Federal Savings & Loan Assn, 200 S. State St., Zone 4, plans by Skidmore Owings & Merrill, 30 W. Monroe St., Zone 3, 15 story, 204,000 sq. ft. office, 209 S. State St, $6,000,000. Constr. in 1961.

▲ **Ill., Peoria**—SHOPPING CENTER—A. J. Couri, 1917 N. Sterling Ave., and Jos. Couri, 2605 Heading Ave., shopping center, 2500 car parking, near Big Hollow Rd. **$4,000,000.** Constr. 1961.

Ind., Indianapolis—OFFICE—Glendale, Inc., Rural St. near Kessler, 2 story professional office, 5 acre site north of Kessler, west side of Rural St., southeast of Glendale Shopping Center, **$600,000.**

Iowa, Des Moines—SHOPPING CENTER—Gabriel Nasr, 547 Country Club Blvd., Zone 12, altering building into shopping center, 1 & 2 story, 53,000 sq. ft., Fleur Dr. and Watrous Ave. **$500,000.**

▲ **Ky., Louisville**—APARTMENT—Al J. Schneider Constr. Co., 3720 7 St. Rd., Zone 18, 9 story apartment, Gray St. between 1 and 2 Sts. **$2,000,000.**

Me., Brunswick—DEPARTMENT STORE—Saul Coppelman, 209 Washington St., Boston, Mass., plans by Arthur Winebaum, 316 Stuart St., Boston, Mass., department store. **$450,000.** J. J. Newbury Co., 4 Federal St., Woburn, Mass., lessee. Constr. 1960.

Mass., Amherst—NEWMAN CENTER—Roman Catholic Diocese Springfield, 62 Elliott St., Springfield, plans by Harry J. Tessier, 220 Dwight St., Springfield, Newman Center, North Pleasant St. **$400,000.** Constr. 1960.

Mass., Marlboro—SHOPPING CENTER—Borough Shopping Plaza, 725 Providence Turnpike, Dedham, Shopping Center addn, Marlboro and Northboro Line, **$450,000.** Bids in October. CD 8/17.

Mass., Webster—CONVENT—R. C. Diocese of Worcester, Zone 1, Tuckerman, plans by O. E. Nault & Sons, 340 Main St, Worcester, Mass., convent for Sisters of St. Ann. **$400,000.** CD 12/31/57.

Minn., Edina—CHURCH, etc.—St. Patricks Church, 700 Cahill Rd., plans by W. B. Kenneth, 921 Pillsbury Bldg., Minneapolis, church and school, social hall, Valley View and Chapel Rds. **$400,000.**

Neb., Lincoln—OFFICE—American Bus Lines, c/o Bartlett-Schumaker-Vennor Co., mgr., 300 S. 13th St., 8 to 10 story bus terminal office. **$1,250,000.**

N. J., Asbury Park—SCHOOL—Diocese Trenton, Parish Lady Mt. Carmel, Asbury and Pine Aves., 2 story school, 1st Ave. **$600,000.**

N. J., Bordentown—MOTEL—Tectonic Assocs., 2772 S. Broad St., Trenton, plans by Donald Pantel, U. S. Hy. 206, Somerville, Clara Barton Motel, Rte. 206. Over **$400,000.**

▲ **N. J., Dunellen**—HOUSING—Philip J. Solonod, 310 W. Westfield Ave, Roselle Park, Green Brook, 73 houses, Blue Ridge and Longview Drives. **$1,175,000.**

▲ **N. J., Erlton**—SHOPPING CENTER—Harold Sarshik, Haddonfield, plans by Evantash & Friedman, 225 S. 15th St. Phila., Pa., shopping center, **$1,000,000.**

▲ **N. J., Middletown**—CLUB HOUSE, etc.—Bamm Hollow Country Club, 32 Broad St., Eatontown, N. J., plans by Hal Purdy, Kingston, N. Y., club house, swimming pool and tennis courts, Middletown Lincroft Rd. **$1,000,000.**

N. J., Morristown—MEDICAL—The Barba Co., 159 Main St., Chatham, plans by Walter Pfeiffer, 109 Washington St., medical bldg., Madison Ave. **$500,000.**

▲ **N. J., New Brunswick**—MOTEL—Donrich Corp. of New York, 122 E. 42 St., New York, N. Y., plans by Meyer & Kasindorf, 10 S. Middle Neck Rd., Great Neck, N. Y., motel, Schoolhouse Lane, East Brunswick. **$1,000,000.**

▲ **N. J., Paramus**—DEPARTMENT STORE—Alexander's, 225 W. 34 St., New York 18, N. Y., plans by Lathrop Douglass, 518 5 Ave., New York 18, N. Y., department store. **$5,000,000.** Sidney Barbanel, 29-46 Northern Blvd., Long Island City 1, N. Y., mechanical engr. Severud-Elstad & Krueger, 415 Lexington Ave., New York 17, N. Y., structural engrs.

▲ **N. Y., New York**—BOWLING CENTER—Jesse Weingart, c/o Maspeth Bowl, 5301 14 St., Elmhurst, plans by Ferrar & Tricardio, 120 W. 42 St., Zone 36, Grand Central Bowl, 3 floor bowling center, Grand Central Terminal Waiting Room. **$2,000,000.** Joseph Bressman, 118 E. 28 St., Zone 16, mechanical engr. Lambert & Dell'Abate, 202 E14 St., Zone 17, structural engrs. Bids about October 1.

N. Y., New York—APARTMENT—Mutual Redevelopment Houses, Inc., 570 Grand St., plans by Herman J. Jessor, 92 Liberty St., Zone 6, 1 story, incl. underground and roof parking apartment, 301-67 W. 26 St. **$500,000.**

N. Y., Tarrytown—MEDICAL CENTER—Owner c/o Santillo & Filard, archts, 180 South Broadway, White Plains, 2 story medical center. **$400,000.**

O., Centerville—SHOPPING CENTER—Arthur Beerman & Assocs., 4217 N. Main St., Dayton, shopping center, 28 acre site, along St. Rte, 48, **$500,000.**

O., East Cleveland—APARTMENTS—Owner c/o Gee. Leslie, 24350 Hilltop Dr., Cleveland, Zone 24, three 3 story apartments Doan and Hayden Aves. **$650,000.**

O., South Euclid (Br. Cleveland)—DORMITORY—Notre Dame College, Green and College Rds., dormitory, **$600,000.**

▲ **Pa., Harrisburg**—APARTMENT etc.—Allen Constr. Co., Rt. 15, State Hill Rd., Camp Hill, plans by Herbert & Clarence Lilien, 1841 Broadway, New York 23, N. Y., 15 story apaprtment, office, hotel, garage, N. E. C., Front and Market Sts. **$4,000,000.**

▲ **Pa., Maple Glen**—SHOPPING CENTER—Owner, c/o Emlen & Co., Spring House, Pa., shopping center, Welsh Rd., etc. **$1,000,000.**

▲ **Pa., New Castle**—YMCA and YWCA—Directors, YMCA & YWCA, YMCA & YWCA, on the Diamond. **$1,500,000.**

R. I., Coventry—APARTMENT—Hoxie Realty Co., Tiogue Ave., plans by Louis R. Samson, 1047 Main St, Warwick, apartment, Nooseneck Hill Rd. and Central Ave. **$400,000.** Constr. 1960.

S. C., Hiltonhead—HOTEL—Atlantis Development Co., 6447 Eastshore Rd., Columbia, plans by Sanders, Crowe & McCoy, 1001 Broadway Extension, Myrtle Beach, motor hotel. **$500,000.** Harold Reed & Assocciates, 1615 Gervais St., Columbia, consult. engrs. CD 8/31.

▲ **Tex., Amarillo**—TEACHERS HOME—Board Trustees, Texas State Teachers Assn. brick, masonry Retired Teachers Home. **$1,500,000.**

Tex., Amarillo—STORE—Thrift City, Inc., 1000 NE 3 St., remodeling, addns. to store, warehouse, into discount store, 1000 auto paved-parking center, appurtenances, **$400,000.**

Tex., Corpus Christi—SHOPPING CENTER—Carmel Village Corp., c/o 4818 Concord St., plans by Jack R. Turner & Bert Haas Asso. archt; 4818 Concord St., Carmel Village Shopping Center, Carmel Parkway & S. Staples St. **$475,000.**

▲ **Tex., Dallas**—STORE—Art Linkletter Home Owner's Mart, 311 S. Akard St., 1 story, 150,000 sq. ft., store, **$2,000,000.**

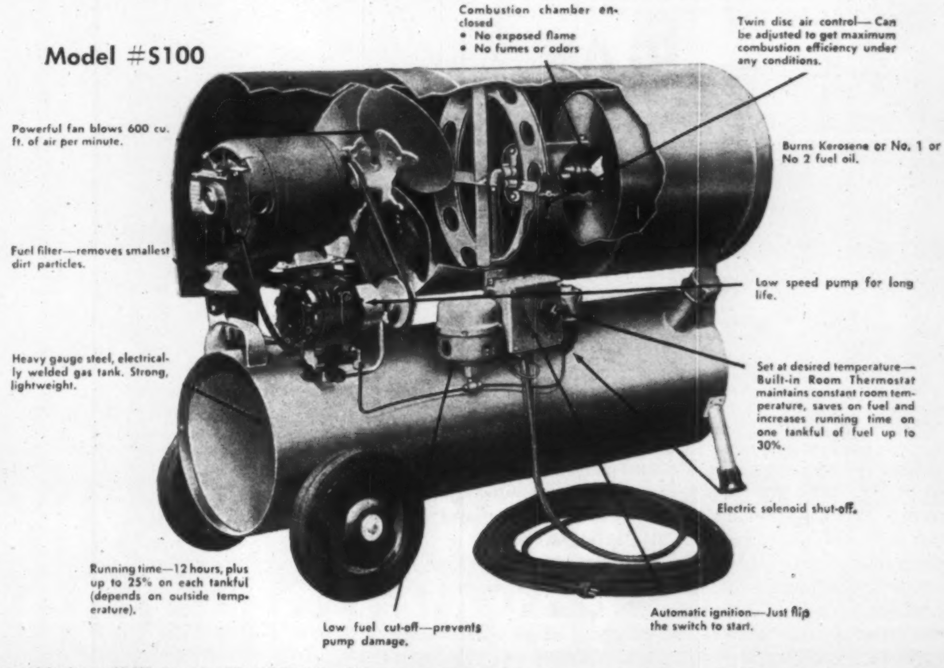
▲ **Tex., Dallas**—STORE—Jas. & Vernon Smith Co., 2151 Fort Worth Ave., store, Jupiter Rd. and NW Hy., **$1,000,000.**

Tex., Dallas—APARTMENT—Senior Circle Southland, Inc., 4749 Homer St., plans by A. B. Swank, 2611 Cedar Springs Rd., and Associated Architects & Planners, 2611 Cedar Springs Rd., 100 apartment units Southland, in Oak Cliff, **$700,000-$800,000.** CD 8/18.

▲ **Tex., Dallas**—APARTMENTS—Trammell Crow, 425 S. Field St., Dallas, Tex., plans by Harwell H. Harris, 3603 Lemmon Ave. Phase 1, 15 story, 150,000 sq. ft., masonry, rein.-con. apartment, **$1,350,000;** Phase 2, 15 story, 150,000 sq. ft., masonry, rein.-con.

NEW STOW portable space heater...*with the built-in room thermostat*

- Insures constant temperature
- Plus fuel savings up to 30%


Model #S100
Combustion chamber enclosed
• No exposed flame
• No fumes or odors
Twin disc air control— Can be adjusted to get maximum combustion efficiency under any conditions.
Powerful fan blows 600 cu. ft. of air per minute.
Burns Kerosene or No. 1 or No 2 fuel oil.
Fuel filter—removes smallest dirt particles.
Low speed pump for long life.
Heavy gauge steel, electrically welded gas tank. Strong, lightweight.
Set at desired temperature—Built-in Room Thermostat maintains constant room temperature, saves on fuel and increases running time on one tankful of fuel up to 30%.
Electric solenoid shut-off.
Running time—12 hours, plus up to 25% on each tankful (depends on outside temperature).
Low fuel cut-off—prevents pump damage.
Automatic ignition—Just flip the switch to start.

Available in models from 100,000 to one million BTU/HR. To select the correct size heater for your job, write for FREE complete Heater Catalog Number 6016.

STOW MANUFACTURING CO., 19 Shear St., Binghamton, N. Y.

CIRCLE 225 ON READER SERVICE CARD

apartment, **$1,600,000;** Phase 3, 15 story, 150,000 sq. ft., masonry, rein.-con. apartment, **$1,500,000;** Phase 4, 15 story, 150,000 sq. ft., masonry, rein.-con. apartment, **$1,425,000.**

▲ **Tex., Houston**—OFFICE—American General Insurance Co., Rusk Bld., office, **$8,500,000.**

▲ **Tex., Houston**—HOTEL—Cullen Center, Inc., First Nat'l. Bank, plans by Weton, Becket & Associates, 5647 Wilshire Blvd., Los Angeles 36, Calif., 10 story American Hotel, swimming pool, Jefferson, Smith and Pease Sts., **$4,000,000.** Hotel Corp. of America will operate. CD 12/10.

Tex., Marble Falls—HOTEL—McClure Bintliff, 8813 Robindell St., Houston, plans by Brooks & Barr, Perry-Brooks Bld., Austin, resort hotel, 100 units guest cottages, 4-level swimming pool. **$500,000.**

▲ **Tex., Portland**—MOTEL, etc.—La Havana Corp., c/o Republic Bank Bld., Dallas, 150-unit luxury Marina Motel, 1,000 ft. pier, at end Main St., adjoining East Cliff, Addn. No. 1. **$1,500,000.**

▲ **Tex., Portland**—MOTEL, etc.—Viking Motor Motels, Inc., 5728 Woolridge St., Corpus Christi, 102 unit motel, piers and docks, Hy. No. 181, **$1,000,000.**

Tex., San Antonio—BANK—American Bank of Commerce, 110 W. Forrest St., Victoria, will not construct bank, Fredericks Rd. **$400,000.** Project abandoned. CD 1/8.

▲ **Utah, Ogden**—APARTMENT—William J. Holmes & Assocs., 336 31 St., plans by Arthur Mueller, 3900 Riverdale Rd., 6 story, bsmnt. apartment and 75-car parking, 29 and Buchannan. **$1,200,000.**

Utah, Salt Lake City—Y.M.C.A.—Young Mens Christian Assn., 39 Exchange Pl., plans by Edwards & Daniels, 1407 S. 22 E., Y.M.C.A., incl. swimming pool, etc. **$700,000.** CD 10/29/54.

▲ **Va., Hampton**—SCIENCE—Hampton Institute, E. Queen St., plans by Moses & Livas, Hampton Institute, E. Queen St., 3 story DuPont Science Bldg. addn., alterations, **$1,500,000.** Hilyard R. Robinson, 1927 11th St., Wash., D. C., consult. engrs. CD 7/20.

Va., Newport News—OFFICES—The Noland Co., 2600 Virginia Ave., offices, **$750,000.**

W. Va., Salem—DORMITORY, etc.—Salem College, Salem, dormitory and dining hall, **$640,000.**

Wis., Eau Claire—SHOPPING CENTER—H. M. Garber & Assocs., 4020 Minnetonka Blvd., Minneapolis, Minn., plans by Ackerberg & Cooperman, 1216 Nicollet Ave., Minneapolis, Minn., 50,000 sq. ft. shopping center, Madison and Oxford Sts., **$700,000.**

▲ **Ont., Caladon**—HOLIDAY VILLAGE—Knight Co. Ltd., c/o Murray Mintz, 164 Eglinton Ave. E., Toronto. Holiday Village, incl. 2 large accommodation blocks, outdoor, indoor swimming pools, tennis and badminton courts, bowling alley, etc. **$3,000,000.**

▲ **Ont., Toronto**—APARTMENT—Apogee Investments Ltd., c/o Harvey Keith, Realtors, 181 Eglinton Ave. E., 17 story apartment, Roehampton Ave. **$4,000,000.**

Que., Granby—HOME FOR AGED—Pavilion Granby Ltee., c/o J. B. Jolicoesure and Paul E. Dubord, 1425 Markham St., Mount Royal, plans by Jean Quellet, 3600 Barclay Ave., Montreal, two story, wood brick Home for Aged, Robinson St. S., **$425,000.**

Que., Nicolet—CATHEDRAL—Corp. Episcopale Catholique Romaine du Diocesse de Nicolet, Nicolet, plans by Gerard Malouin, 100 St. Jean Baptiste St., cathedral, **$800,000.** Bourgeois & Martineau, 3365 Ridgewood Ave., Montreal, consult. engrs. CD 5/16/56.

▲ **Que., Petit Lac Magog**—CENTRE—Institut Val du Lac, Centre, Notre Dame de la Joie, plans by Alphonse Belanger, 46 North Vimy St., Sherbrooke, 1 story, Y-shaped, 48x260 and 60x90 ft. retarded girls centre, **$1,000,000.** CD 1/27.

▲ **Que., Three Rivers**—HOUSING—La Cooperative Ste. Marguerite, Paroisse Ste. Marguerite, Three Rivers. 130 duplexes, 2 story, concrete brick housing. **$1,700,000.**

INDUSTRIAL BUILDINGS

Ala., Pisgah—PLANT—Scottsboro Mfg. Corp., Scottsboro, garment mfg. plant to be known as Dover Mills, **$208,500.**

▲ **Calif., San Fernando**—MANUFACTURING PLANT—Bendix Corp., 11600 Sherman Way, Los Angeles, plans by Welton Becket & Assoc., 10000 Santa Monica Blvd., Los Angeles, 200 x 300 ft. mfg. plant, 15825 Roxford St. **$2,098,000.**

▲ **Iowa, Cedar Rapids**—PLANT ADDN.—Collins Radio Co., 50 St. and C Ave. N.E., Northwest Corner Manufacturing Bldg. addn. **$1,400,000.**

▲ **La., Abbeville** — PLANT — Phillips Petroleum Co. & Assocs., Bartlesville, Okla., natural gasoline plant. **$2,250,000.**

▲ **N. J., Annandale**—PLANT—Electronics Plastics, Inc., P.O. Box 125, Woodbridge, Clinton Twp. plant, Sunnyside Rd. **$1,250,000.** Scientific Design Co., Inc., 2 Park Ave., New York, N. Y., consult. engrs.

N.J., Linden—WAREHOUSE—Miller Steel Co., 40 Montgomery St., Hillside, warehouse, Bedel Place, between Allen and Park Ave. **$400,000.**

▲ **N.J., Newark**—PACKAGING CENTER, etc.— P. Ballantine & Sons, 57 Freeman St., packaging center, warehouse, Christie St. **$10,000,000.** United Engineers & Constructors, Inc., 60 Park Pl., Newark, N.J., engrs.

N. J., Salem—WAREHOUSE—Anchor-Hocking Glass Corp., 1 story 250x300 ft. warehouse. Over **$600,000.**

▲ **N.J., Swedesboro**—PLANT—Monsanto Chemical Co., 445 Park Ave., New York N.Y., plasticizers plant, Logan Twp. Over **$3,000,000.**

▲ **N. C., Charlotte**—ROLLING MILL—Florida Steel Corp., 1715 Cleveland St., Tampa, Fla., 51,000 ton steel furnace and rolling mill. **$3,300,000.**

▲ **O., Wooster**—PLANT, etc.—Rubbermaid, Inc., 1205 E. Bowman St., 110,000 sq. ft. of plastic products plant, offices and warehouse, Rt. 5, NE of here. **$1,000,000.** Constr. 1960.

▲ **Pa., Morrisville**—PLANT OFFICE—American Bridge Division of U. S. Steel Corp., plans by G. C. Freeman, 419 Carsonia Ave., Reading, plant office. **$1,000,000**

Tex., Longview—PLANT—Texas Eastman Co., plant, Over **$500,000.** Brown & Root, Inc., Engineers, 1st Nat'l Bank Bldg., consult. engrs. CD 3/30.

AMERICANS ABROAD

▲ **B. W. I., Trinidad**—PLANT—W. R. Grace & Co., 7 Hanover Sq., New York 5, N. Y., U.S.A., plant to convert iron ore into sponge iron, Port of Spain. **$30,000,000.**

LATIN AMERICA

▲ **Brazil**—Brazilian Federal Govt., State of Rio de Janeiro, Sao Paulo and Guanabara, hydroelectric plant, Salto do Funel. **$32,000,000.**

▲ **El Salvador**—Comison Ejecutiva Hidroelectrica del Rio Lempa, San Salvador, expansion of Guajoyo hydroelectric power plant on River Lempa, near Desague River, incl. transmission facilities. **$5,540,000.** (World Bank loan, $3,840,000).

FOREIGN

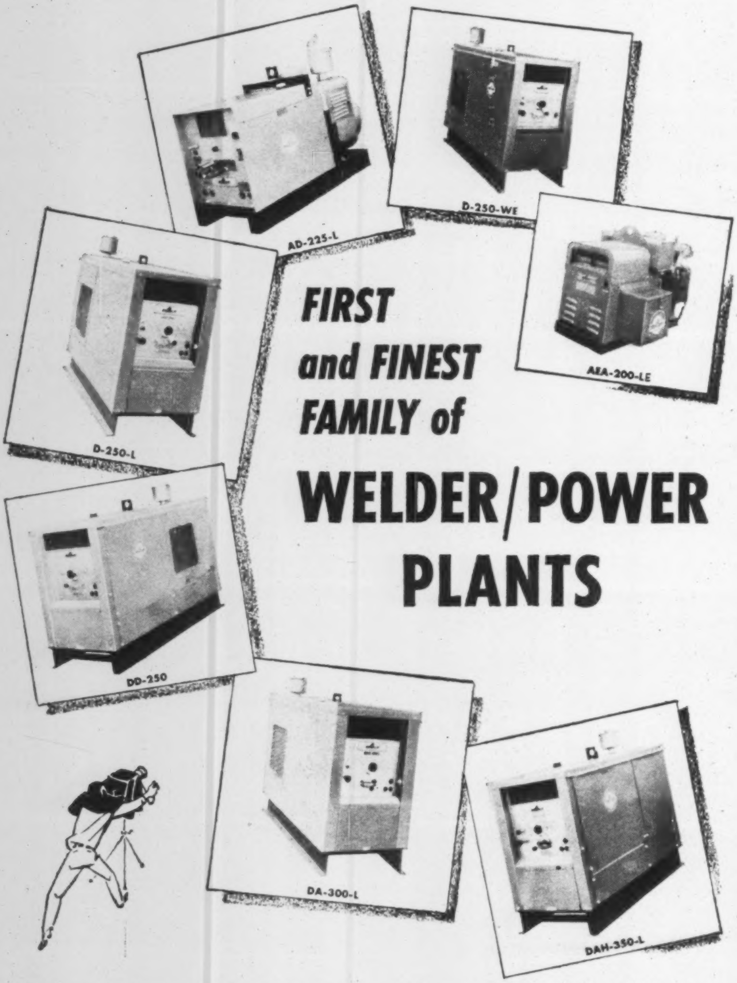
▲ **India, Bombay**—PLANT—Gov. of India, New Delhi, chemical plant. **$25,000,000.** Bayer, Hoechst, B.A.S.F. and Friedrich Uhde Co., West Germany, will give technical aid.

▲ **Italy, Casavatore** — PLANT — Magrini Meridionale S.p.A., subsidiary of Magrini S.p.A., Bergamo, Italy, plant for manufacture of electrical equipment. **$3,500,000.**

▲ **Pakistan**—PRESIDENTIAL PALACE, etc.—Gov. of Pakistan, Rawalpindi, presidential palace, parliament bldg., secretariat, housing, roads, communications network for new capitol 250 sq. mi. Islamabad. **$40,000,000.**

▲ **Scotland, Inveralmond**—PLANT—John Dewar & Sons, Ltd., Dewar House, Haymarket, London SW 1, England, blending and bottling plant, near Perth. **$3,000,000.**

▲ **Tunisia**—Govt. of Tunisia, Tunis, irrigation and water supply project consisting 190 ft. earth and rockfill dam and 69,000 acre-foot reservoir on Oued Nebana. **$18,000,000.** (DLF loan).



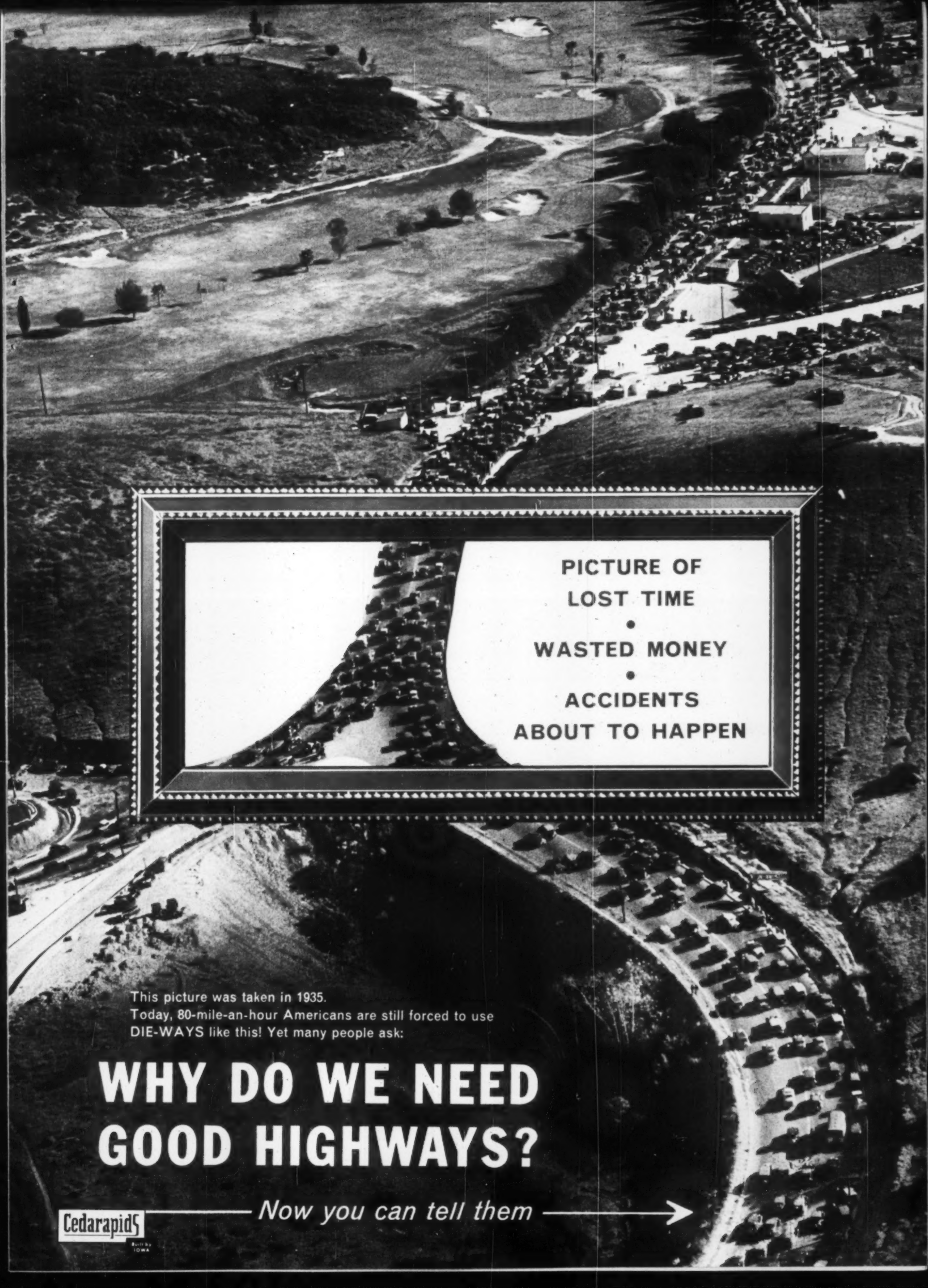
FIRST
and FINEST
FAMILY of
WELDER/POWER
PLANTS

Miller originated the combination welder/power plant. This established a lead never lost notwithstanding the most widespread efforts at copying and duplication. Shown here are gas and diesel engine driven welders in d-c and a-c/d-c models.

In this group there is a welder/power plant size, type and price to meet every practical need — all available with field-tested accessories and trailers.

Complete specifications will be sent promptly upon request. Please indicate model or models.

miller ELECTRIC MANUFACTURING CO., INC., APPLETON, WISCONSIN
Distributed in Canada by Canadian Liquid Air Co., Ltd., Montreal


PICTURE OF
LOST TIME
•
WASTED MONEY
•
ACCIDENTS
ABOUT TO HAPPEN

This picture was taken in 1935.
Today, 80-mile-an-hour Americans are still forced to use
DIE-WAYS like this! Yet many people ask:

WHY DO WE NEED GOOD HIGHWAYS?

Cedarapids Built by IOWA

Now you can tell them →

INTERSTATE
IOWA
80
30
N.Y.
5
BENTON
H
COUNTY
OREGON
207

43 REASONS WHY AMERICA NEEDS BETTER HIGHWAYS NOW!

Strangulation of our national economy by a gigantic nationwide traffic jam, and the crippling of our defense effort through failure to keep the Federal Highway Program going, would be more costly than any of us can afford.

But most American citizens *don't know why* we need good roads. They are apathetic. Because they do not understand, there is little public support for a well-planned, nationwide system of interstate, state and rural roads.

It is up to us to give the public the facts . . . show our friends, neighbors, and associates the benefits the Highway Program will bring to each individual . . . how it affects his pocketbook, even his life. Only when every citizen knows the facts can public opinion influence *intelligently* the men who make the laws to keep the Highway Program rolling.

Here are 43 of the hundreds of reasons why we must have better highways now. Add your own reasons and use them all to help obtain the enthusiastic local support we need.

GOOD ROADS SAVE MONEY

1. Total annual avoidable waste over *all* roads in the U.S. amounts to $3 billion. Interstate Highways would save $550,000,000 in gas consumption, brake and tire wear, vehicle operation—save $725,000,000 now wasted on traffic accidents —save $825,000,000 in time lost by commercial vehicles.

2. Modern Interstate Highway engineering eliminates steep grades, sharp curves, intersections at grade, stop and go driving. Good highways can bring about annual savings of $750,000,000 in direct operating costs of trucks and buses.

3. Payments of insurance covering property damage and personal injuries resulting from highway accidents equal 12½¢ per gallon of gas consumed, That equals $116 for every motor vehicle registered.

4. It costs less right now to build a typical mile of Federal Aid Highway than it did during the first three months that the 1956 Highway Act was in effect.

GOOD ROADS SAVE LIVES

5. In 1920, the traffic death rate per 100 million miles was 28.2. In 1940, the death rate was 11.4. Then we started building better, safer roads. Bertram D. Tallamy, federal highway administrator, predicts that the death rate will decline from the 5.6 per 100 million miles in 1958 to 5.0 in 1970 and to 4.4 in 1975.

6. The controlled access highway is at least 2½ times safer than the ordinary highway. On Virginia's Shirley Highway, with controlled access, the fatality rate is 0.8 deaths per 100 million miles. On the parallel U.S. 1, with no control of access, the death rate is 10.6.

7. Traffic accidents today are killing 38,000 people annually. Experts estimate that highways *engineered for safety* would save 4000 lives per year. By 1970, continued use of The Interstate System could save 37,800 people.

8. If traffic volume increases by 50% in the next ten years, there will be 55,000 fatalities a year—unless safer roads cut the rate.

9. In Chicago, the chance of having an auto accident on congested streets is 30 to 50 times greater than on the new Congress Street Expressway.

10. In 1959, accidents cost $4.3 billion. Modern highways *can* eliminate a very large part of the monetary waste of accidents.

GOOD ROADS FOSTER ECONOMIC GROWTH

11. Modern highways are a sound, durable investment in the growth of the Nation.

12. The dollar value of goods and services for a specific period is called the Gross National Product. $1 billion of highway construction contributes to the Gross National Product as follows: Steel, 510,000 tons; bituminous materials, 995,000 tons; cement 16,000,000 barrels; explosives, 18,345,000 lbs.; aggregates, 76,415,000 tons; petroleum products, 122,794,000 gallons; construction equipment, 34,584 pieces; trucks and cars, 22,500 pieces. These are based on each $1 billion in excess of an annual rate of $5.8 billion of construction.

13. The New York Thru-Way is officially credited with stimulating 650 million dollars worth of industrial, commercial and residential development, including $50 million around Tarrytown alone.

14. With the New Jersey Garden

State Parkway, the gain in taxables and retail business in the counties it serves is *twice* that of New Jersey's remaining 11 counties.

15. On Route 128 near Boston, some 227 companies have built 17 industrial parks and 175 million dollars worth of buildings to house upwards of 28,000 people—workers with good wages to spend.

GOOD ROADS ARE ESSENTIAL FOR NATIONAL DEFENSE

16. In case of war, *all* sections of the country must be swiftly available for the defense effort.

17. Highways are relatively invulnerable to atomic attack. It would take 20,000 Hiroshima-type bombs to destroy the 40,000 miles of the projected Insterstate System.

18. We need good highways to evacuate people from our cities; bring in food; bring in medical supplies and help; move large volumes of military vehicles and weapons.

19. Highways are extensions of production lines; defense production depends on them. During World War II, 8 out of every 10 parts needed to make a tank in Cleveland came by truck from 23 states. 75% of the workers in 749 defense plants drove to work in their automobiles. 60% of all out-bound tonnages from defense plants was road-borne.

20. A network of good highways will assure nation-wide mobility for all our defense resources.

GOOD ROADS BENEFIT LABOR

21. The American working man drives his own car to his job. He can offer his services throughout a greater area; he has a greater diversification of jobs to choose from.

22. With good highways, the laboring man can think in terms of minutes rather than miles of driving to and from his job.

GOOD ROADS BENEFIT FARMERS

23. American farmers operate over 6,406,000 motor vehicles (including 3 million trucks). 89% of all farm products now reach their markets by highways.

24. Better rural roads bring markets and sources of farm supplies closer together, make schools more accessible to farm homes, make medical services readily accessible.

GOOD ROADS INCREASE BUSINESS

25. One out of every six businesses (mostly small, independent firms) serve the Transportation Industry. Good roads are a shot in the arm to the small businessman.

26. Of the people who do the buying, 60% own automobiles. American consumers spend $38 billion per year to own and operate their cars, helping to support garages, service stations, manufacturers of automotive parts and accessories, etc.

27. 60% of American buyers purchase goods that are transported via highways, streets and alleys. Fast deliveries increase business.

28. 70 million Americans take vacations by car each year (over 75% of tourist travel is by car), averaging 1013 miles per round trip. Many others travel by bus. Altogether they spend $9.2 billion on vacations. This is big business for motels, resorts, restaurants, and souvenir shops, to name a few!

29. The annual bill for recreation travel is $14 billion. 22% of this is automobile expense. Big business for the automotive industry!

GOOD ROADS FURTHER FULL EMPLOYMENT

30. One out of every seven American jobs is in the field of Highway Transportation.

31. Truckers provide over 5,750,000 jobs. Highway Transportation Industries provide 9.7 million jobs. Employed is a labor force equal to the population of all New England states, Arizona, Colorado, Idaho, Montana, New Mexico, Wyoming.

32. Each $1 billion spent on highway construction equals 102 million man-hours of employment on the site of construction and 126 million man-hours off the site—a total of 228 million man-hours of labor.

33. In 1958, an extra $400 million in highway contracts, let as an anti-recession measure, provided 137 million man-hours of employment and broke the back of the recession.

GOOD ROADS BENEFIT ALL INDUSTRY

34. For the Trucking and Motor Carrier Industry alone, Interstate type highways provide these advantages: —Reduction in number of power units required; use of lighter tractors; increased tire life; reduction in fuel and maintenance costs; reduction of accidents and insurance premiums; year-'round maintenance of on-time schedules for livestock and perishable goods.

35. The Private Consulting Engineer profession carries 40% of the engineering load of the new Interstate System.

36. Utilities are free from the burden of acquiring easements of private land because so many consumers are located on good highways. In Oregon, a utility study shows savings of about $100 a mile on 3212 miles of public right-of-way, mostly passed on to consumers.

37. Practically every industry is stimulated by increasing motor vehicle registrations. In 1959, registrations totaled 70,416,000 (3.1% more than in 1958). *In 1971*, it is estimated that 101,200,000 motor vehicles will travel over a trillion miles annually (20.7% on the Interstate System). *In 1976*—114 million motor vehicles will travel 1.2 trillion miles a year.

38. By 1976, 230 million people will need industrial goods and services fostered by increased travel on highways, rural roads and city streets.

GOOD ROADS BENEFIT EVERY CITIZEN

39. 8 million children ride buses to school every day of the school year. They need *safe* all-weather roads.

40. Movement of goods and people is faster on modern highways.

41. Time saved means lower transportation costs and lower prices for truck-borne merchandise.

42. Annoying, dangerous traffic congestion is reduced.

43. Modern highways, engineered to last by the application of results of the AASHO test road research at Ottawa, are the cheapest investment a private citizen can make to insure his life, his security, his country's growth, and his children's future.

Cedarapids
Built by IOWA

There is *one* big reason why YOU should get behind this program for enlightening the public on the benefits of a continuing Federal Highway Program. Highway construction is vital to your way of life and the growth of your community. Here you have the ammunition to inform and mold public opinion into supporting, and demanding, vital highway legislation. *Use it!*

Keep Building America WITH BETTER SAFER HIGHWAYS NOW! SAVE LIVES TIME MONEY

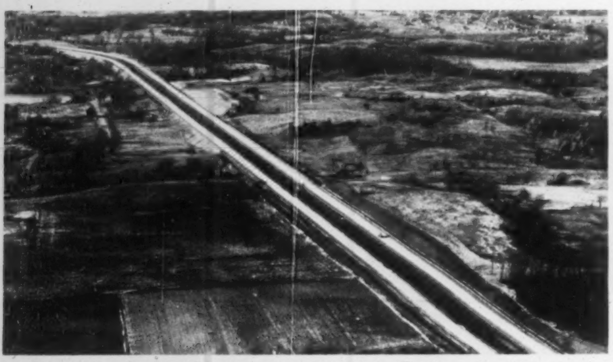
BUILD BETTER HIGHWAYS NOW! *Save Lives—Save Time—Save Money*

Sponsored as a public service by **IOWA MANUFACTURING COMPANY** *Cedar Rapids, Iowa, U.S.A.*

A GLIMPSE OF THE FUTURE
demanded by Mr. and Mrs. America

Through-city expressways provide fast transport of goods and services; save time, money and lives of city workers; foster economic growth.

Well-planned interchanges like this relieve traffic congestion to assure safe, easy access to transcontinental highways from urban areas, speeding produce from factory to consumer.



Straight, safe, controlled access Interstate Routes should cover the Nation for greater mobility in Peace or War. Goods and people, weapons and troops must move swiftly to every section of the country to strengthen our economy and defense efforts.

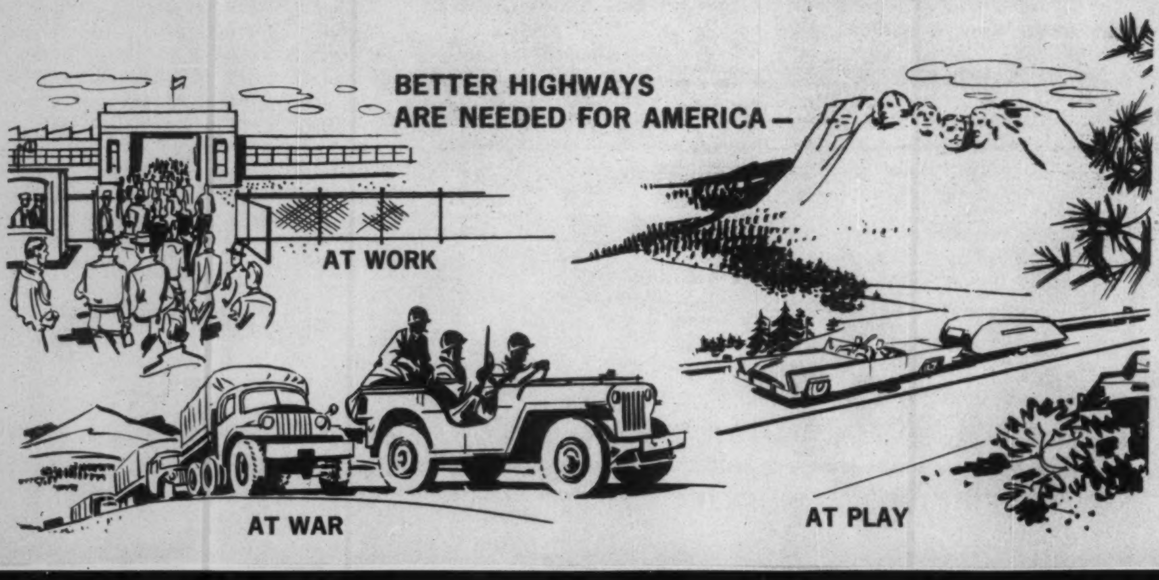
America today is a nation on wheels. Broad, safe highways open new recreational areas and expand tourist trade. Good, all-weather roads across mountainous terrain speed transcontinental commercial travel.

Cedarapids Built by IOWA

BETTER ROADS MEAN BETTER LIVING

INS 18

Sponsored as a public service by YOUR CEDARAPIDS DEALER PRINTED IN U.S.A.
in cooperation with Iowa Manufacturing Company, Cedar Rapids, Iowa



Bids—Low Bids—Contracts—Second Section

NEW ENGLAND

HEAVY CONSTRUCTION—BA

STATE HIGHWAY LETTINGS

STREETS AND ROADS

September 27 Massachusetts   September 28 Maine

BUILDINGS—BA

Conn., Colchester—SCHOOL—BA 10/4—Town, School Bldg. Com., Central School, Proj. No. Conn. 60-C-702-A10, Junior-Senior High School addn. to Colchester Elementary School, $650,000. Plans deposit $25. Malmfeld & Assocs., 36 Pearl St., Hartford, archts., Bemis & Freeman, 36 Pearl St., Hartford, engrs. CD 4/18.

▲ **Conn., Greenwich**—SCHOOL—BA 11/28—Town, Town Hall, 3 story, West Junior High School, Post Rd., Byram, $1,675,000. CD 10/26.

HEAVY CONSTRUCTION—LB & CA

Conn., Meriden—City, City Hall, trunk sewer, along Crow Hollow Brook from W. Main St. to Sodom Brook, **$190,000**; 18-to-36 in. main sewer along Harbor Brook from Broad St. to pumping Station at Coe Ave., Pumping station, Coe Ave. **$790,000.**

BUILDINGS—LB & CA

▲ **H. P. Cummings Constr. Co.**, High St., Woodsville, N. H., LB **$1,328,333**, JUNIOR-SENIOR HIGH SCHOOL, SOUTH BURLINGTON, VT. Town, 1000 Williston Rd., South Burlington, Vt. Bids Sept. 13. CD 8/17.

Fontaine Bros., Inc., 40 Hendricks St., Chicopee Falls, Mass., CA **$496,900**, MANUFACTURING PLANT, Suffield St., AGAWAM, MASS. Crompton & Knowles Corp., 93 Grant St., Worcester, Mass. Bids Sept. 8. CD 8/26.

Owner, c/o Home Builders Assocs., High St., Bridgewater, Mass., Owner Builds, **$400,000**, 18 HOUSES, Clover Heights, High St., BRIDGEWATER, MASS.

▲ **Bemroy Constr. Co.**, 5629 Main St., Trumbull, Conn., Owner Builds, **$1,501,000**, 99 HOUSES, Payne Rd., BETHEL, CONN.

▲ **Frouge Constr. Co., Inc.**, 141 North Ave., Bridgeport, Conn., CA **$1,763,000**, low rent HOUSING, Proj. Conn 11-1, MERIDEN, CONN. Meriden Housing Authority, 46 Broadvale Rd., Meriden, Conn. CD 8/12.

▲ **Walter Trojanowski**, 1101 E. Main St., Bridgeport, Conn., Owner Builds, **$1,365,000**, 70 HOUSES, "Potomac Park," Twitchgrass Rd., TRUMBULL, CONN. CD 11/7/58.

▲ **Monarch Builders & Developers**, 516 Main St., Middletown, Conn., Owner Builds, **$2,670,000**, 200 HOUSES, "Deerfield Acres", Camp St., WESTFIELD, CONN.

MIDDLE ATLANTIC

HEAVY CONSTRUCTION—BA

STATE HIGHWAY LETTINGS

BRIDGES

September 30 Pennsylvania   October 20 New York

STREETS AND ROADS

September 27, October 4 Maryland
September 30 Pennsylvania   October 6 New Jersey
October 20 New York

BUILDINGS—BA

Pa., Freedom—SCHOOL—BA 10/5—Pa. Public School Bldg. Authority, 101 S. 25th St., Harrisburg, Grade School, for Baden-Economy Jt. School Dist., Freedom, R. D. 1, $450,000. Plans deposit $40. B. J. McCandless, 239 4th St., Ellwood City, archt. CD 2/23.

▲ **N. Y., New York**—LIBRARY & RESEARCH—BA 10/11—Cornell University Medical College, 1300 York Ave., Zone 13, Samuel J. Wood Library and Research Bldg., 1300 York Ave. $3,000,000. Rogers & Butler, 219 E. 44 St., Zone 17, archts. Meyer, Strung & Jones, 230 Park Ave., Zone 17, mechanical engrs. Purdy & Henderson, 1 Madison Ave., Zone 10, structural engrs. CD 6/10.

▲ **N. Y., Deer Park**—SCHOOLS—BA 10/26—Deer Park Union Free School Dist. No. 7, 1861 Deer Park Ave., Washington Elementary School, $1,439,850, elementary school addns. $3,045,300. Frederic P. Wiedersum, 65 Roosevelt Ave., Valley Stream, archt. CD 7/5.

BUILDINGS—SLC

N. J., Atlantic City—HOTEL ADDN.—Marlborough-Blenheim Hotel, Park Ave. and Boardwalk, soon lets contract hotel addn. $400,000. Stephen B. Hazzard, Warrington, Pa., archt.

N. J., Pennsauken—PLANT—George M. Ewing Co., archts.-engrs., Western Savings Fund Bldg., Phila., Pa., soon lets contract, 1 story, 52,000 sq. ft. masonry and steel concrete margerine mfg. plant and railroad facilities for Standard Brands Inc., 625 Madison Ave., New York, N. Y. $400,000. CD 9/12.

N. J., Salem — WAREHOUSE, etc. — Anchor-Hocking Glass Co., 109 N. Broad St., Lancaster, O., soon lets contract 1 story, 84,039 sq. ft.. masonry, steel warehouse, office bldg. and railroad facilities. Over $750,000. CD 9/9.

HEAVY CONSTRUCTION—LB & CA

John C. Peterson Constr. Corp., 958 Church St., Baldwin, N. Y., LB **$136,613**, (5 bidders), Contr. 5, 1960 street imprvts., FREEPORT, N. Y. Village, 46 No. Ocean Ave., Freeport, N. Y. Baldwin & Cornelius, 101 So. Bergen Pl., Freeport, N. Y., engrs. Bids Sept. 12..

▲ **Hendrickson Bros., Inc.**, 63 No. Central Ave., Valley Stream, N. Y., LB **$1,892,942**, (4 bidders), general contract sewage plant incl. sludge thickening facilities, lime handling facilities, effluent pumping station, garage and storage, Bay Park, MINEOLA, N. Y. Bd. Supervs. Nassau Co., Franklin Ave., Mineola, N. Y. Bids Sept. 13. CD 8/17.

Hilson Contg. Co., P. O. Box 797, Clark, N. J., CA **$567,274**, (9 bidders), Contr. 1, sewer mains, SPRING LAKE HEIGHTS, N. J. Borough of Spring Lake Heights, 616 Mercer Ave., Spring Lake Heights, N. J. Claude Birdsall, 1700 F St., Belmar, N. J., engr. Grand total $979,889. CD 3/30;
Thomas Proctor, Inc., 218 North 5 Ave., Long Branch, N. J., CA **$313,745**, (4 bidders), Contr. 2, treatment plant (Spring Lake Heights, N. J.);
Spinello Constr. Co., 249 Wallace St., Orange, N. J. CA **$98,870**, (4 bidders), Contr. 3, outfall sewer and force main (Spring Lake Heights, N. J.).

PENNSYLVANIA—Pa. Hy. Dpt., 506 North Office Bldg., Harrison,

New Enterprise Stone & Lime Co., Inc., New Enterprise, Pa., CA **$988,474**, (2 bidders), 17,087 ft. divided hy. of plain cement concrete base with bit. surf., 5 bridges, Altoona City, Logan Twp., Blair Co. Bids Aug. 5. CD 9/8.

Erb Engineering & Constr. Co., 440 E. Church Rd., Bridgeport, Pa., LB **$147,997**, Bid 3809, paving, PHILA, PA. Phila. Procurement Dpt., City Hall Annex, Phila, Pa. Grand total $509,946. Bids Sept. 1. CD 8/22.
James D. Morrissey, Inc., 9119 Frankford Ave., Phila., Pa., LB **$137,157**, Bid 3801, paving, (Phila. Pa.);
Eastern Asphalt Co., 2 Penn Center Plaza, Phila., Pa., LB **$127,817**, Bid 3807, paving, (Phila., Pa.);
Union Paving Co., 1 E. Wynnewood Rd., Wynnewood, Pa., LB **$96,975**, Bid 3803, paving, (Phila., Pa.).

MARYLAND—State Rds. Comn., 300 W. Preston St., Baltimore, Zone 3,

Nello L. Teer Co., Inc., Durham, N. C., CA **$613,263**, grading, drainage surf. 4.608 mi. Hy.-Woods Corner to Clinton. P-391-23-320, Prince George Co. Bids Aug. 2. CD 8/10, under LB.

▲ **Wright Contrg. Co.**, Odenton, Md., LB **$4,845,514**, (9 bidders), section Jones Falls Expressway, BALTIMORE, MD. City, Bureau Hys., 303 Municipal Bldg., Baltimore 2, Md. Bids Sept. 14. CD 8/31.

Chas. J. Spielman, 2901 Maisel St., Baltimore 30, Md., LB **$109,853**, (9 bidders), Contr. 730W, water main extensions, Old Harford Rd. and Summit Ave. near Baltimore, TOWSON, MD. Baltimore County, County Office Bldg., Towson, Md. Bids Sept. 8. CD 8/29.

BUILDINGS—LB & CA

Peter Galasso, Inc., 37 Moultrie St., Brooklyn 22, N. Y., CA Est. **$350,000**, 1 story, WAREHOUSE and OFFICE, Meeker and Varick Aves., BROOKLYN, N. Y. Eskay Carpet Co., 235 Pulaski St., Brooklyn 6, N. Y. Abrahams, Hertzberg & Cantor, 207 E. 37 St., New York 16, N. Y., archts.-engrs.

▲ **Gerace & Castagna**, 2110 Northern Blvd., Manhasset, N. Y., CA **$2,000,000**, APARTMENT, Franklin Blvd. and Boardwalk, LONG BEACH, N. Y. Long Beach Terrace, Inc., 161-10 Jamaica Ave., Jamaica, N. Y. CD 8/22, under LB.

▲ **Geo. A. Fuller Co.**, 597 Madison Ave., New York 22, N. Y., CA Est. **$3,500,000**, 12-14 story OFFICE, 2 story CHAPEL on ground floor, Northwest corner 43 St. and Second Ave., NEW YORK, N. Y. Protestant Episcopal National Council, 281 Park Ave. So., New York 10, N. Y. Adams & Woodbridge, 215 E. 37 St., New York 16, N. Y., archts.

▲ **Kibel Bldg. Co., Inc.**, 2727 Palisade Ave., New York 63, N. Y., Owner Builds, **$1,500,000**, 20 story APARTMENT, 440 E. 57 St., NEW YORK, N. Y. Geo. C. Miller, 125 W. 45 St., New York 36, N. Y., archt.

Mars Assoc. Inc. & Normel Constr. Corp., 271 Church St., New York 13, N. Y., CA **$739,000**, general contract, altering Bronx Community COLLEGE, NEW YORK, N. Y. Bd. Higher Educ., Bronx Community College, Business Office, Rm. 12, 120 E. 184 St., New York 68, N. Y. Bids July 15. CD 7/25, under LB.

J. D. Constr. Co., 50 Piermont Rd., Cresskill, N. J., CA Est. **$700,000**, 30 HOUSES, County Rd., CRESSKILL, N. J. James D'Agostino, 60 Westervelt Ave., Tenafly, N. J., Morehouse & Chesley, 114 Waltham St., Lexington, Mass., archts.

▲ **Frank Brisco Co., Inc.**, 287 S. 19 St., Newark, N. J., CA 2 story RESEARCH LABORATORY, 1 story CHEMICAL EQUIPMENT WAREHOUSE and GARAGE, MORRISTOWN, N. J. Allied Chemical Corp., 61 Broadway, New York 6, N. Y. Total est. **$1,000,000.** Voorhees, Walker, Smith, Smith & Haines, 101 Park Ave., New York, N. Y., archts.;
Carlone Constr. Co., 4 Tanglewood Dr., Summit, N. J., CA site preparation for Research Laboratory, Chemical Equipment Warehouse and Garage (Morristown, N. J.).

Junard Holding Corp., Park Square Bldg., Morristown, N. J., Owner Builds, **$650,000**, 18 HOUSES, Skyview Section, Highland Woods, MORRISTOWN, N. J.

Garven Constr. Co., 1478 Morris Ave., Union, N. J., Owner Builds, **$450,000**, 20 HOUSES, Ridgeview Ave., NEW PROVIDENCE, N. J.

Jerry J. Sprella, Rte. 46, Pine Brook, N. J., Owner Builds, **$600,000**, 20 HOUSES, Hook Mountain Rd., PINE BROOK, N. J.

Church Lane Constr. Co., Lakehurst, N. J., Owner Builds, Over **$400,000**, RESIDENTIAL DEVELOPMENT, Church Rd., etc., TOMS RIVER, N. J.

Edward H. Fengya, 85 Crescent Dr., Packanack Lake, N. J., Owner Builds, **$450,000**, 30 HOUSES, Conklintown Rd., WANAQUE. N. J. C. J. Kordys, Hamburg Pike, Wayne, N. J., archt.

▲ **Reisinger Brothers, Inc.**, East North St., Carlisle, Pa., CA **$1,327,700**, general contract, Central Dauphin East HIGH SCHOOL, Rutherford Rd. at Londonderry Rd., Lower Paxton Twp., HARRISBURG, PA. Central Dauphin School Dist. Authority, 4600 Locust Lane, Harrisburg, Pa. W. L. Murray & Associates, 1600 N. 2nd. St., Harrisburg, Pa., archts. Bids Aug. 2, awarded Sept. 12. CD 8/6.

▲ **Henry J. Knott**, 2 W. University Parkway, Baltimore, Md., CA Est. **$2,000,000**, brick, steel, concrete, block MEDICAL OFFICE-APARTMENT, 550 N. Broadway, BALTIMORE, MD. Broadway Development Corp., c/o contractor. Cochran, Stephenson & Wing, 925 N. Charles St., Baltimore 1, Md., archts.

Kirby & McGuire, Inc., 2518 Greenmount Ave., Baltimore 18, Md., CA **$718,000**, brick, concrete, steel, block SCHOOL, CONVENT and RECTORY, McLean Blvd. and Northern Parkway, BALTIMORE, MD. Archdiocese of Baltimore, Mulberry and Charles St., Baltimore 1, Md. Bids Aug. 18. CD 8/17.

Rupert Constr. Co., 3400 Lancaster Ave., CA **$412,600**, SUNDAY SCHOOL BLDG. and CHURCH, WILMINGTON, DEL. Zion Evangelical Lutheran Church, 601 N. Jackson St., Wilmington, Del. CD 8/31.

SOUTH

HEAVY CONSTRUCTION—BA

STATE HIGHWAY LETTINGS

BRIDGES

September 27 North Carolina   September 30 Florida
October 26 Virginia

STREETS AND ROADS

September 27 North Carolina   September 30 Florida
October 26 Virginia

† **Tennessee**—BA 10/6—U. S. Eng., P. O. Box 97, Memphis, Zone 1, Levee Item No. L-729.2, 176,000 cu. yd. embankment, 30 acres fertilizing and sodding, along McKellar Lake, Ensley, Shelby Co. Inv. No. CIVENG-40-041-61-15, $25,000-$50,000.

† **Kentucky**—BA About 10/11—U. S. Eng., P. O. Box 59, Louisville, Zone 1, channel imprvt. 57,600 cu. yd. channel excav., 2,800 cu. yd. stone protection and filter material below Rough River Reservoir Dam, Breckinridge Co. CIVENG-15-029-61-16. $100,000. Plans deposit $1. CD 9/2, under LB.

▲† **Virginia**—BA 10/20—U. S. Eng., 502 8 St., Huntington 1, W. Va., intake structure, dam and spillway for John W. Flannagan Dam and Reservoir Proj., Pound River, CIVENG-46-022-61-15. $6,500,000. CD 9/8.

BUILDINGS—BA

Ky., Morehead—DORMITORY—BA 10/14—Commonwealth of Ky., Div. Purchases, Frankfort, 4 story 280-man dormitory. Over $600,000. George L. Shannon, Prestonburg, archt. S. R. Ronald & Assoc., 554 S. 3 St., Louisville, Zone 2, engrs.

HEAVY CONSTRUCTION—LB & CA

SOUTH CAROLINA—State Hy. Dpt., Office Bldg., corner of Senate and Assembly St., Columbia,

Wannamaker & Wells, Inc., P. O. Box 542, Orangeburg, S. C., CA **$755,536**, (Scheme A not draining Portman Shoals area), substructures for twin rein. con. Bridges over Seneca River on Interstate Rte. 85 northwest of Anderson, S. C., Docket No. 4.505-F.A., Proj. No. I-85-1(4), Anderson Co. Bids Aug. 30. CD 8/25.

▲ **Atlantic States Constr. Co.**, 1958 Monroe Dr. N. E., Atlanta, Ga., CA **$3,996,608** Garden City Terminal addn., Savannah State Docks, SAVANNAH, GA. Georgia State Ports Auth., P. O. Box 1039, Savannah, Ga. Bids Aug. 16. CD 8/22, under LB.

Ajax Engineering Co., 1322 N. Mills St., Orlando, Fla., LB **$148,958**, sanitary sewer imprvs., DAYTONA BEACH, FLA., City, City Hall, Daytona Beach, Fla. CD 9/8.

† **Laclede Steel Co.**, Arcade Bldg., St. Louis, Mo., CA **$407,374**, reinforcing steel bars, Wheeler Dam, ALABAMA, Tennessee Valley Authority, New Sprankles Bldg., Knoxville, Tenn., awarded Sept. 14. CD 1/28/59.

BUILDINGS—LB & CA

▲ **Innanen Brothers**, P. O. Box 6087, Orlando, Fla., CA Est. **$1,500,000**, APARTMENT, DAYTONA BEACH, FLA., Diplomatic Center Investment Corp., Ellinor Village, Daytona Beach, Fla. CD 6/6.

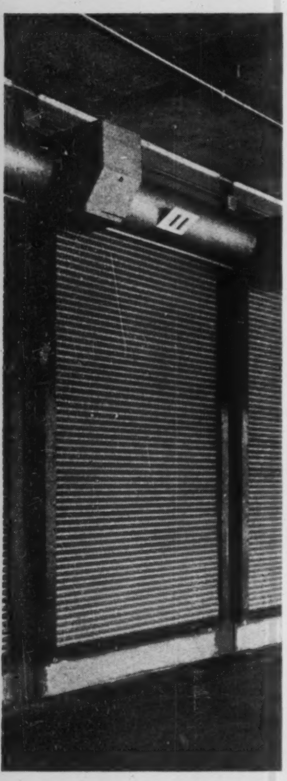
Jack Culpepper, 114 E. 5th Ave., Tallahassee, Fla. CA Est. **$400,000** MOTOR HOTEL, PERRY, FLA. T. G. Gandy, 2818 W. Lake Shore Dr., Tallahassee, Fla.

▲ **Livesy & Company**, P. O. Box 5261, Atlanta, Ga., CA **$1,251,000**, STEAM ELECTRIC POWER PLANT,

Kinnear Motor Operated
Rolling Doors...

a feature of Theo. Hamm Brewing Company's

Automated Loading Dock



Here again, Kinnear Rolling Doors play a key role in *modern efficiency at its best!*

The 23 power-operated Kinnear Rolling Doors you see above are controlled independently from a master switch.

Conveyors ending just inside each door deliver pallets holding cases of beer to the loading dock. The door can then be opened by remote control. A fork truck picks up the pallets, travels onto dock levelers (at right, top photo) and loads the pallets on the waiting truck.

(Empty cases on pallets are returned to other conveyors through doorways installed higher above the dock level.)

By opening straight upward and coiling compactly over the doorway Kinnear Rolling Doors permit conveyors to come within *inches* of the door. Doors can be placed as close together as desired, with control switches at each door if preferred.

(Auxiliary chains, for door operation in case of power failure, are stored in the hood of each door.)

A rugged, all-metal curtain protects each opening when the Kinnear Rolling Door is closed — a positive barrier to trespassers, vandals, wind, and weather, *plus added protection against fire.*

Your needs may be vastly different; but *wherever you need* doors, you need the advantages of Kinnear Rolling Doors.

The KINNEAR Manufacturing Company

FACTORIES:

1820-40 Fields Avenue
Columbus 16, Ohio
1742 Yosemite Avenue
San Francisco 24, Calif.

Offices and Agents in All Principal Cities

KINNEAR
ROLLING DOORS
Saving Ways in Doorways

VERO BEACH, FLA., City, City Hall, Vero Beach, Fla. Bids Aug. 23. CD 9/1.

▲ **Westmore & Parman, Inc., Contractors,** P. O. Box 63, Jackson, Miss., CA **$2,105,318,** 1 story, steel frame, brick concrete blocks, glass PLANT, GREENVILLE, MISS. Owner, c/o F. E. Hall & Assocs. and Harold Kaplan, archt., 109 W. Walnut St., Greenville, Miss.

▲ **Zayre Corp.,** 1 Mercer Rd., Natick, Mass., Owner Builds, **$1,000,000,** 60,000 sq. ft. DEPARTMENT STORE, 16 acre plot, Dixie Hy., LOUISVILLE, KY.

▲ **Vernon M. Williams & Sons,** 1805 Hayes St., Nashville, Tenn., CA **$1,300,000,** 150 RESIDENCES, north section, NASHVILLE, TENN. National Homes Development Corp. of Tenn., 3600 Saratoga Dr., Nashville, Tenn.

MIDDLE WEST

HEAVY CONSTRUCTION—BA

STATE HIGHWAY LETTINGS

BRIDGES

September 27 Ohio **September 29 Indiana**
October 4 Wisconsin

STREETS AND ROADS

September 27, 29 Ohio **October 4 Wisconsin**

† **Michigan**—BA 9/27—U. S. Eng., 1101 Washington Blvd., Detroit, Zone 26, channel imprvt., clearing shaping, excav., riprap, filling, 1,300 ft. channel, cutoff channel, Kalamazoo River, Battle Creek. CIVENG-20-064-61-9. Extended date. $100,000. Plans deposit $1.10. CD 9/6.

† **Ohio**—EROSION CONTROL—BA 9/29—U. S. Eng., 502 8th St., Huntington, W. Va., erosion control, project for Special AAA facilities, Cincinnati Defense Area. ENG-46-022-6I-3B.

† **Ind., Fort Benjamin Harrison**—BA 9/30—ELECTRONIC PROCESSING—U. S. Eng., 536 South Clark St., Chicago 5, Ill., alterations to electronic data processing machine room in Bldg. 83, U. S. Army Finance Center, Fort Benjamin Harrison, Indianapolis, Serial No. ENG-11-032-61-4. Plans deposit $5. CD 8/2.

† **Ohio**—BA On Or About 10/4—U. S. Eng., 502 8th St., Huntington, W. Va., recreational facilities at two locations consisting grading; constr. access roads and parking areas composed of 6 in. base course, 1¼ in. b. conc. leveling course and 1¼ in. b. conc. surface course; constr. concrete boat launching ramps; constr. two masonry public shelters, and drilling water well at each site, Dillon Dam, Muskington Co., on Licking River, Inv. No. CIVENG-46-022-61-16, $100,000. CD 9/29/59.

▲ **Ill., Caseyville**—BA 10/5—Village, Bd. Trustees, Village Hall, sanitary sewers and lift stations and water extensions. $1,225,000. Plans deposit $50. David J. Johnston, 212 N. 7 St., East St. Louis, Ill., engrs. CD 8/31.

† **Mich., Kincheloe Air Force Base**—INDUSTRIAL TYPE BLDG.—BA 10/6—U. S. Eng., 1101 Washington Blvd., Detroit, Zone 26, concrete masonry, steel framed air conditioning industrial type bldg., ENG-20-064-61-13. About $300,000. Plans deposit $3.40. Extended date. CD 9/6.

BUILDINGS—BA

Ill., **Chicago**—LAUNDRY—BA 9/27—State of Illinois, Springfield, laundry at Chicago Medical Center, $762,000. CD 4/19/45.

▲ O., **Columbus**—SCHOOL—BA 9/29—Hamilton Twp. Bd., Educ., 4999 Lockbourne Rd., high school, $1,019,000. CD 9/6.

O., **Canton**—SCIENCE HALL—BA 10/15—Malone College, 515 25th St. N.W., (selected list of bidders), Timken Science Hall, $500,000. CD 7/16/59.

HEAVY CONSTRUCTION—LB & CA

▲ **OHIO**—Dpt. Hys., State Dpt. Bldg., Columbus, Zone 15,

Ohio—**John F. Casey Co.,** P. O. Box 1888, Pittsburgh, Pa., CA **$7,420,674,** Type T 71 and structure 4.284 mi., SR 18-17.20, I 680-9(1), City of Youngstown, Proj. 291, Mahoning Co.;

Ohio—**Peter Kiewit Sons,** 15806 Lorain Ave., Cleveland. O., CA **$1,254,958,** Type T 71, structure 1.775 mi. USR 40-9.66, I 70-7(6) 155, Proj. 293, Muskingum Co.;

Ohio—**V. N. Holderman & Sons,** 890 Oakland Park Ave., Columbus, O., CA **$1,242,130,** Type T 71, structures 0.682 mi. USR 40-11.52 and I 70-7(18)157, City of Zanesville, Proj. 294, Muskingum Co.;

Ohio—**D. E. Goodchild, Inc.,** P. O. Box 184, Circleville, O., CA **$638,823,** Type T 35, 4.658 mi. USR 22.0.00, (19.58-20-.52) Proj. 301, Fairfield and Pickaway Counties. Grand total $10,556,585. Bids June 28. CD 9/12.

Complete General Constr. Co., 1221 E. 5th Ave., Columbus, O., CA **$219,849,** 18- to 30-in. Beulah Rd. sub-trunk sewer, west of Karl Rd. from Morse Rd. to Rte. 161, COLUMBUS, O. City of Columbus, City Hall, Columbus, O. Bids Sept. 6. CD 8/20/54.

▲ **ILLINOIS**—Dpt. P. Wks. & Bldgs., Div. Hys., Centennial Bldgs., Springfield, Bids 9/13,

Ill.—**J. M. Corbett Co.,** 2500 S. Corbett, Chicago, Ill., LB **$248,441,** (7 bidders), widen span bridge over Des Plaines River and approaches on US 66, Cook Co.;

Ill.—**Culberson Constr. Co.,** R.R. 3, Pana, Ill., LB **$151,609** (6 bidders), 2 railroad grade separations

(Continued on page 235)

Chain Link Fence

Guard Rail

ANCHOR FENCE

Division of ANCHOR POST PRODUCTS, INC.®

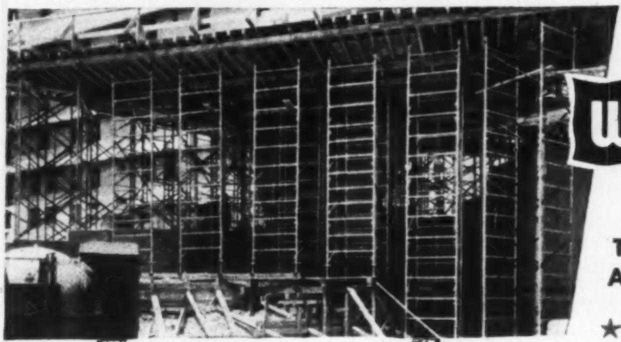
Provides Profitable Plus Factors . . .

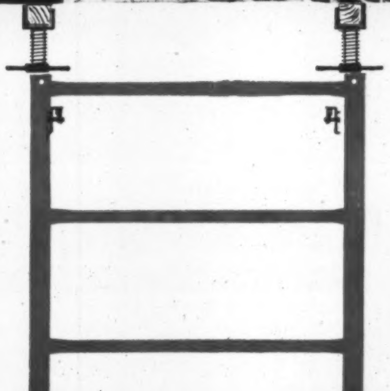
Technical Assistance—Reliability—Experience —Nationwide Service—Prompt Erecting

How do you choose your subcontractor for fencing and guard rail when the bids are close? Naturally, you look at the intangibles—the kind of plus factors that often make a big difference in your profit on the *finished job*. With Anchor it's a point of pride to be able to offer more than just top-quality materials. In back of every Anchor bid is over 68 years of experience on jobs in every corner of the country. Anchor maintains 44 regional offices, ready to give you on-the-spot technical help and prompt erecting service. There's an office near you. Why not give them a call? And for more data on all Anchor safety devices, write:

ANCHOR POST PRODUCTS, 6542 Eastern Ave., Baltimore 24, Md.

CIRCLE 58 ON READER SERVICE CARD





WACO

HI-LOAD
HEAVY DUTY SHORING

THE ANSWER TO ALL YOUR SHORING PROBLEMS

- ★ Shores safely to any required height.
- ★ Carries 10,000 lbs. per leg, 20,000 lbs. per panel.
- ★ Completely versatile.
- ★ Has load bearing top ledger.
- ★ Easy erection and storage.
- ★ Experienced factory engineering service.

Check the Yellow Pages for your nearest Waco Distributor or . . .

WRITE TODAY
for the complete Waco Hi-Load Story.

HI-LOAD
SHORING
WACO

WACO Manufacturing Company
DIVISION OF WACO-PORTER CORPORATION
5251 West 130th Street • Cleveland 30, Ohio

Licensees: Armson Iron Works, Windsor, Ontario
Tubular Structures Corp. of America, Los Angeles, California

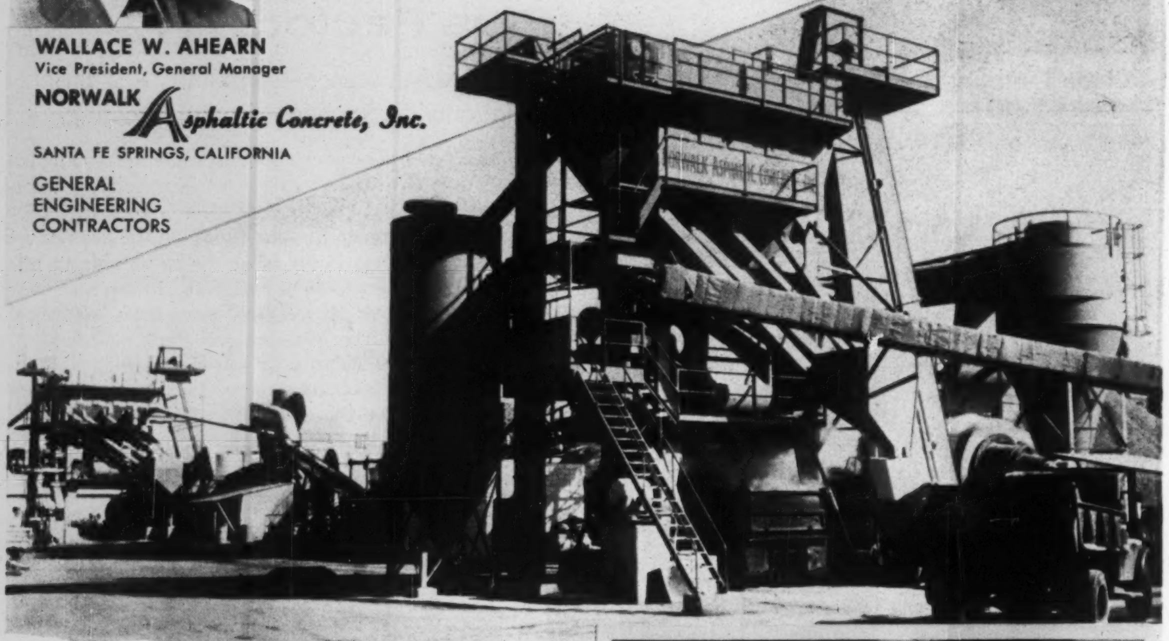
CIRCLE 233 ON READER SERVICE CARD

WALLACE W. AHEARN
Vice President, General Manager
NORWALK Asphaltic Concrete, Inc.
SANTA FE SPRINGS, CALIFORNIA
GENERAL
ENGINEERING
CONTRACTORS

"With our big 8000-lb. MADSEN ASPHALT PLANT we get

350 TONS PER HOUR

...2800 tons in an 8-hour day"

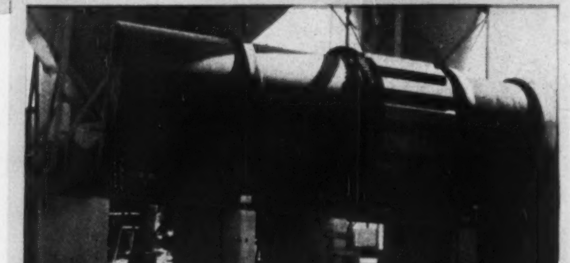


"We're engineering contractors and we recognize superior engineering in a piece of equipment. We own and operate two MADSEN Model 481 Asphalt Plants . . . a 4000-lb. plant and an 8000-lb. plant and we sincerely believe MADSEN Plants are the finest-engineered plants in the industry.

"It takes a big plant to turn out 350 tons of asphaltic mix per hour and MADSEN Plants have "more beef" than other plants. We've experienced only 7 hours downtime in 4 years of operating our 4000-lb. plant . . . a tribute to our own preventative maintenance program and to the fact that MADSEN Plants are built to last.

"We like the externally removable segment-liner feature of the MADSEN Pug Mill Mixer. It's a cinch to service and the mixer liners are interchangeable which means longer mixer life.

"MADSEN Asphalt Plants are CLEAN OPERATING. Actual tests show that they emit not over 10 lbs. per hour of solids to the atmosphere . . ."



Inset photo shows the 104" x 32' MADSEN Dryer used with the 8000-lb. MADSEN Plant. Dryer is equipped with forged steel floating tires. Other plant components include: a Hauck 14" burner, a 50-ton capacity hot bin, oversize hot elevator, Symons 60" x 16' double deck with split deck screen, MADSEN Model 7812 Triple Wet Tube Dust Washer, and Ray bin level indicators (showing high and low positions).

For high, money-making production and low-cost operation . . . there's no equal to the MADSEN Model 481 Asphalt Plant. Call your MADSEN Distributor for the complete story on this outstanding plant. Built in 4000-lb., 5000-lb., 6000-lb. and 8000-lb. batch capacities.

MADSEN WORKS LOS ANGELES
Equipment that Serves

MADSEN maintains a complete parts stock in Los Angeles and Lima, Ohio

1910 - 1960 50 YEARS — SERVING INDUSTRY

HELPING TO BUILD THE HIGHWAYS OF THE WORLD MADSEN Serving 1910

MADSEN WORKS
Construction Equipment Division
BALDWIN-LIMA-HAMILTON CORPORATION
P.O. BOX 38, La Mirada, California

BALDWIN BLH LIMA-HAMILTON

BALDWIN-LIMA-HAMILTON CORPORATION P.O. Box L, Lima, Ohio

MADSEN PRODUCTS

ASPHALT PLANTS • PUG MILL MIXERS • AGGREGATE DRYERS • DUST COLLECTORS • ROAD PUG TRAVEL MIX PLANTS • WEIGH BATCHERS • DUST WASHERS • FEED BUNKERS FEED TUNNELS • ASPHALT TANKS • ASPHALT & FUEL PUMP UNITS • CONCRETE FLOAT FINISHERS FOR AIRPORTS AND HIGHWAYS • HIGHWAY-AIRPORT BASE STABILIZER PLANTS

CIRCLE 234 ON READER SERVICE CARD

(Continued from page 232)

FA 1-70 over B. & O. R. R. south of Altamont, Effingham Co.;

Ill.—**Gorman & Sons**, 4408 State St., East St. Louis, Ill., LB **$907,568** (4 bidders), grade separation Exchange Ave. over E. St. Louis Expressway, St. Clair Co.;

Ill.—**Emil P. Hendricks**, 6754 North Sheridan, Chicago, Ill., LB **$110,727** (2 bidders), widen 2 bridges on Ill. 47, north of Sibley, Livingston Co.;

Ill.—**Ryan, Inc.**, P.O. Box 206, Janesville, Wis., LB **$236,870** (9 bidders), 2 grade sep. FA 1-74, south of Moline, Rock Island Co.;

Ill.—**Sangamo Constr. Co.**, 700 U. MacArthur, Springfield, Ill., LB **$134,384** (5 bidders), grade sep. FA 155 over county roads north of Springfield, Sangamon Co.;

Ill.—**L. B. Strandburg & Son**, 385 Dearborn, Chicago, Ill., LB **$323,045** (9 bidders), 2 grade sep. FA 1-74 over US 6 and railroad, near Green Rock, Henry Co.;

Ill.—**Burnell G. Watson**, P.O. Box 303, Chatsworth, Ill., LB **$133,010** (3 bidders), rebuild bridge over Vermilion River on Ill. 47 near Forrest, Livingston Co.;

Ill.—**Wendnagel & Co., Inc.**, 600 W. Cermak, Chicago, Ill., LB **$91,563** (9 bidders), furnish steel for 2 grade sep. on FA 1-74 south of Moline, Rock Island Co.;

Ill.—**Allied Structural Steel Companies**, 20 North Wacker Dr., Chicago, Ill., LB **$89,096** (8 bidders), identical bid, furnish steel 2 bridges FA 1-74 over US 6 & R.R. S.W. of Green Rock, Henry Co.;

Ill.—**American Br. Div., U. S. Steel Corp.**, 20 South LaSalle St., Chicago, Ill., LB **$89,096** (8 bidders), identical bid, furnish steel 2 bridges, FA 1-74 over US 6 & R.R. S.W. of Green Rock, Henry Co. CD 8/30.

▲ **ILLINOIS**—Dpt. P. Wks. & Bldgs., Div. Hys., Centennial Bldgs., Springfield, Bids opened 9/13,

Ill.—**J. P. Hollerich Co.**, P.O. 214, La Salle, Ill., LB **$594,121** (3 bidders), paving 0.41 mi., Ill. River Bridge at Peru, La Salle Co.; LB **$166,108** (3 bidders), resurf. Ill. 91 from int. Ill. 93, South to Toulon, 5.83 mi., Stark Co.; LB **$131,498** (2 bidders), resurfacing US 6 between Spring Valley and Peru, 2.61 mi., Burian-La Salle Counties;

Ill.—**Heeffken Bros., Inc.**, 222 W. B St., Belleville, Ill., LB **$2,120,115** (2 bidders), paving, frontage roads ramps on FA 1-70 near Fairmount City, St. Claire Co.; LB **$754,070** (2 bidders), paving, relocated alt. US 67 east National City, 1.2 mi., St. Claire Co.; LB **$646,528** (3 bidders), resurface on FA 2 from south of Centralia to city limits, 3.13 mi., Washington and Marion Counties;

Ill.—**Robt. A. Black, Inc.**, 13912 S. Halsted, Chicago, Ill., LB **$1,285,120** (4 bidders), base course Ill. 50 in Chicago, Oaklawn and Hometown, 1.89 mi.; LB **$279,862** (5 bidders), widening base on US 6 in Harvey and Markham, Cook Co.;

Ill.—**G. H. Allen**, R.R. 5, Vincennes, Ind., LB **$249-345** (3 bidders), surface and bridge on FAS 801, north of Westport, 1.21 mi., Lawrence Co.;

Ill.—**Alpha Asphalt Co.**, 304 Ill. Ave., E. St. Louis, Ill., LB **$142,136** (4 bidders), resurfacing on US 51 from Du Quoin north, 4.17 mi., Perry Co.;

Ill.—**American Asphalt Co.**, 9701 South Torrance, Chicago, Ill., LB **$107,903** (8 bidders), resurface on FA 121 in Hickory Hills, 2.12 mi., Cook Co.;

Ill.—**J. D. Barter Constr. Co.**, 215 South Jackson, Harrisburg, Ill., LB **$147,665** (3 bidders), base course and resurface on SB1-140 north of Cave In Rock, Hardin Co.;

Ill.—**Belvidere Constr. Co.**, Allason Bldg., Belvidere, Ill., LB **$245,002**, (2 bidders), base course and bridge on FAS 1068 mi. of Mt. Carroll, 1.48 mi.; Carroll Co.;

Ill.—**Eric Bolander Constr. Co.**, Winchester Rd., Libertyville, Ill., LB **$182,823** (2 bidders), improve 2 intersections on US 41 in Halfdan Rd., Larce Forest and in Highland Park, Lake Co.;

Ill.—**P. H. Broughton**, 908 Cleveland, Springfield, Ill., LB **$178,515** (7 bidders), resurface Ill. 29, Rochester to Edinburg, 8.39 mi., Sanqamon and Christian Counties;

Ill.—**Caldwell Eng. Co.**, 803 West College Dr., Jacksonville, Ill., LB **$333,847**, (3 bidders), resurfacing on Ill. 104 in Jacksonville, 1.74 mi., Morgan Co.;

Ill.—**G. S. Chastain Co.**, 2505 N. Jaspar, Decatur, Ill., LB **$325,405**, paving and sewers on E. Garfield St., in Decatur, Macon Co.;

Ill.—**Coles Asphalt Co.**, Box 122, Maltoon, Ill., LB **$142,301** (4 bidders), resurface in Benton, 3.42 mi., Franklin Co.;

Ill.—**Contr. & Material Co.**, 1235 Dodge Ave., Evanston, Ill., LB **$696,215**, (4 bidders), paving on FAS 116 from Palatine, east, 3.22 mi., Cook Co.;

Ill.—**Crowley-Shepherd Asohalt Co.**, 2701 South 12th., Chicago, Ill., LB **$162,323**, (6 bidders), resurf on Cicero Ave., Ill. 50 in Chicago, 1.93 mi. Cook Co.;

Ill.—**Danville Constr. Co.**, 23 W. Harrison St., Danville, Ill., LB **$132,265** (4 bidders), resurface on Ill. 9 west of Hoofeston, 3.54 mi., Vermillion Co.;

Ill.—**Davis Constr. Co.**, Plano, Ill., LB **$97,811**, (8 bidders), base course on FAS1255 from Newark, southeast, 3.98 mi., Kendall Co.;

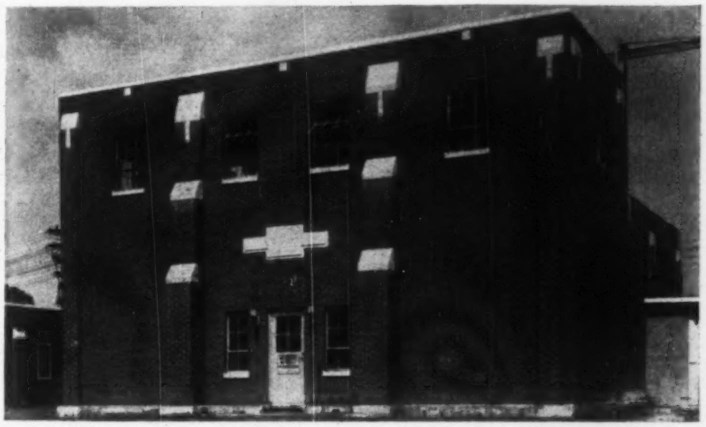
Ill.—**Loitz Bros. & Dyer-Loitz, Inc. & Dyer Constr. Co.**, Grant Park, Ill., LB **$1,325,150**, (11 bidders), paving US 14 by pass at Woodstock, 5.39 mi., McHenry Co.;

Ill.—**Federal Sign & Signal Corp.**, 8700 South State, Chicago, Ill., LB **$656.774** (2 bidders), traffic control installations on FA 1-94 in Chicago, Cook Co.;

Ill.—**Gallagher Asphalt Co.**, 181 St. and Indiana Ave., Thornton, Ill., LB **$91.624** (3 bidders), resurfacing on US 6 in Harvey & Markham, 1.10 mi., Cook Co.;

Ill.—**S. J. Groves & Sons**, 11046 Reynolds, Springfield, Ill., LB **$1,866,207**, (3 bidders), paving on FA 1-70 and 0.76 resurface on Ill. 111 re of E. St. Louis, 2.64 mi., St. Clair Co.;

Use Northern Gravel
for
Rapid Sand Filter



This is the Water Softening Plant at Evansville, Wisconsin. Another of the many, many such plants throughout United States that have been using filtering sand and gravel from the Northern Gravel Company.

Filter Sand Specifications

are carefully laid out. The Effective Sizes and Uniformity Coefficients used by Consulting Engineers and also recommended by the American Water Works Association are the result of long years of research and experience.

The Northern Gravel Company is equipped to give you prompt shipment whether it be one bag or many carloads, exact to specifications. Filter sand can be furnished with an effective size between 0.35 MM and 1.20 MM.

Chemical Quality

of the filter sand is also important. It must be hard, not smooth, and free of soluble particles. This requires perfect washing and grading facilities. We have every modern device for washing, drying, screening and testing.

Filter Gravel

supporting the Filter Sand Bed must be, in turn, properly graded to sizes calculated to support the Filter Sand, and be relatively hard, round and resistant to solution.

Northern Gravel has no equal in facilities and our reserves of both sand and gravel are inexhaustible. Northern Gravel Company has been in business over 45 years. We guarantee uniformity of products and our records enable us to duplicate your requirements on short notice. Our location is central and we have commodity rates in every direction.

Northern Gravel Company
Muscatine, Iowa
Box 307
Phone:
Amherst 3-2711

CIRCLE 235 ON READER SERVICE CARD

HORIZONTAL DOORS:
heavy-duty weathertight

spring-balanced for easy opening!

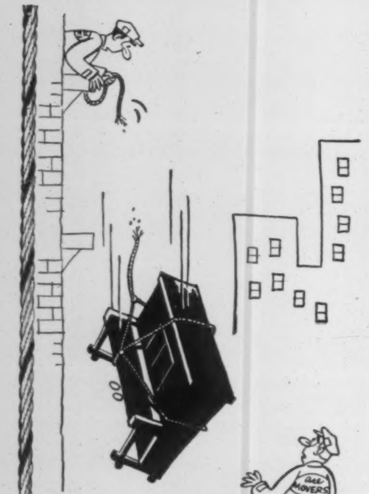
Choose Bilco doors to replace those ponderous, old-fashioned floor- and sidewalk-access doors. Bilco spring-balanced doors feature built-in drainage, long trouble-free life.

FREE CATALOG

Tells all you need to know about sidewalk and basement doors, roof scuttles, ceiling doors and flush floor doors; measurements, weights, specification data!

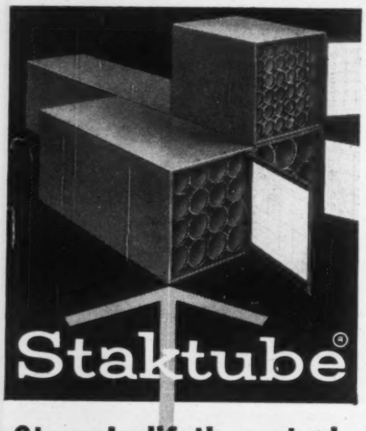
Bilco®
The Bilco Co.,
New Haven Conn.,
HORIZONTAL SPRING-OPERATED DOORS

CIRCLE 63 ON READER SERVICE CARD



LESCHEN WIRE PORTER ROPE DIVISION
H. K. PORTER COMPANY, INC.

CIRCLE 236 ON READER SERVICE CARD



Stacor's lifetime steel
ROLL FILE SYSTEM

"Easy-file easy-find" system to keep rolled prints, plans, maps clean, safe. 32 sizes—8 lengths, 4 tube diameters.

Send NOW for illustrated catalog

STACOR EQUIPMENT CO.
279 Emmet St., Newark, N. J.
Phone: BIgelow 2-6600

CIRCLE 64 ON READER SERVICE CARD

Ill.—**Geo. H. Hartong Co.**, 340 Sherwood Ct., La Grange, Ill., LB **$99,153**, (6 bidders), resurfacing at 6 locations in Coon County, Cook Co.,

Ill.—**Howell Constr. Co.**, 1020 W. Main, Carbondale, Ill., LB **$395,018**, (2 bidders), base course and resurfacing on US 45 in Metropolis, 0.59 mi., Massac Co.,

Ill.—**Madison Constr. Co.**, E. Schwarz St., Box 222, Edwardsville, Ill., LB **$278,203**, (5 bidders), base course and resurface on FA 38, Ill. 16, near Jerseyville, 1.81 mi., Jersey Co.;

Ill.—**H. H. Mass Constr. Co.**, Humtey Rd., Algonquin, Ill., LB **$866,195**, (4 bidders), base course widen and resurface on Ill. 25 in Carpentersville, 2.80 mi., Kane Co.;

Ill.—**Mautz & Owen, Inc.**, 406 W. Jefferson St., P. O. Box 210, Effingham, Ill., LB **$386,196**, (2 bidders), resurface on 4 streets in McLeansboro, Hamilton Co.;

Ill.—**McCalman Constr. Co.**, 617 Secton 54, Danville, Ill., LB **$216,135**, widen and embankment on Ill. 9, west of Hoopeston, 2.77 mi., Vermilion Co.;

Ill.—**McCountry Impr. Co.**, Kahl Bldg., Davenport, Iowa, LB **$90,960**, (2 bidders), resurfacing Ill. Rte. 17 near Aledo, 4.18 mi., Mercer Co.;

Ill.—**McDougall-Hartmann Co.**, 3101 North Adams, Peoria, Ill., LB **$167,592** (2 bidders) base course FAS 1384 from Elmwood east 3.28 mi. Peoria Co;

Ill.—**Meade Elec. Co.**, 5401 W. Harrison, Chicago, Ill., LB **$96,397**, (4 bidders), rebuild traffic controls in 8 spots in Chicago, Cook Co.,

Ill.—**Mitchell Constr. Co.**, 216 E. Madison St., Herrin, Ill., LB **$270,352**, (3 bidders), resurfacing on FAS 906 in Herrin, 0.63 mi., Williamson Co.;

Ill.—**Mount Carmel Sand & Gravel**, P. O. Box 209, Mt. Carmel, Ill., LB **$188,511**, (1 bidder), surface treat on FAS 722 from Putsburg east and bridge, 2.57 mi., Fayette Co.;

Ill.—**Chas. O'Brien & Son Constr. Co.**, 217 Liberty St., Morris, Ill., LB **$229,995**, (8 bidders), base course from Ill. 23, south of Waterman, easterly, 5.32 mi., DeKalb Co.;

Ill.—**R. B. Potashnick Co.**, Cape Girardeau, Mo., LB **$2,635,890**, (4 bidders), grading, bridge, on FA 155 NW of Elsah, 4.80 mi., Jersey Co.;

Ill.—**R. B. Potashnick & D. L. Harrison**, Cape Girardeau, Mo., LB **$432,905**, (3 bidders), paving on FAS 871 between Whittington and Ewing, 2.50 mi., Franklin Co.;

Ill.—**Rein, Schultz & Dahl**, 119 E. Washington Ave., Madison, Wis., LB **$369,833**, (4 bidders), base course FAS 1085 from Apple River Cany on Park South to Rte. 20, 6.31 mi., Jo Daviess Co.;

Ill.—**Ralph Rogers & Co.**, S Adams St., Box 849, Bloomington, Ind., LB **$581,567**, (2 bidders), widen and resurfacing and bridges, Ill 130 north of Olney, 3.47 mi., Richland Co.;

Ill.—**Rossetti Constr. Co.**, 4237 Lincoln Ave., Chicago, Ill., LB **$96,975**, (5 bidders), sewage lift system on FA 1-90 in Elmhurst, DuPage Co.;

Ill.—**Seneca Petro Co.**, 439 W 33rd St., Chicago, Ill., LB **$124,864**, (2 bidders), resurfacing on Ill. 78 near Farmington, 3.86 mi., Fulton Co.;

Ill.—**E. T. Simond Co. & J. D. Barter Co.**, Carbondale, Ill., LB **$879,155**, (5 bidders), paving and ramps on FA 1-57 west of Marion, Williamson Co.;

Ill.—**Suburban Oil Co.**, 7340 W. 15th, Forest Park, Ill., LB **$109,586**, (3 bidders), resurface US 12 from Ill. 31 southeasterly, 6.88 mi., McHenry-Lane Co.;

Ill.—**Triangle Constr. Co.**, 480 N. Evergreen, Kankakee, Ill., LB **$258,897**, (2 bidders), base course on FA 37 in West Frankfort, 0.56 mi., Franklin Co.;

Ill.—**Trygg Paving Co.**, 1 South Eastern Ave., Joliet, Ill., LB **$142,671**, (3 bidders), surface on US 66 frontage roads south of Plainfield, 3.82 mi., Will Co.;

Ill.—**Valley Bldrs. Inc.**, 400 W. First St., Spring Valley, Ill., LB **$376,104**, (4 bidders), base course on US 6 between Spring Valley and Peru, 2.67 mi., Bureau and La Salle Counties;

Ill.—**J. P. Wetherby Constr. Co.**, 1016 W. Superior, Ottawa, Ill., LB **$551,463**, (4 bidders), widen and resurface on Ill. 29 in Putnam, 3.21, Putnam-Marshall Counties;

Ill.—**Black Top Roads Co.**, 2545 N. Mannhein Rd., Melrose Park, Ill., LB **$172,899**, (3 bidders), base widen and resurface on Gary Ave. in Wheaton, 1.92 mi., Du Page Co.;

Ill.—**Zimmerly Constr. Co.**, Paris, Ill., LB **$187,301**, (1 bidder), base course and resurfacing on SB 1-1 near Marshall, 0.72 mi., Clark Co. CD 8/30.

Ted Zontelli Constr., Inc., Ironton, Miss., CA Est Over **$150,000**, 129 mi. buried telephone wire and cable WIS. 545C, Elk Lake, WISCONSIN, West Wisconsin Telephone Cooperative, Inc., Downsville, Wis. CD 8/17, under LB.

Acton Constr. Co., Inc., 1811 W Co. Rd. C. St. Paul, Minn., LB **$548,776**, (7 bidders), sewage treatment plant, BROOKFIELD, WIS., City, City Hall, Brookfield, Wis. Bids Sept. 7. CD 8/15.

† **U. S. Eng.**, 1101 Washington Blvd., Detroit 31, Mich., cancelled bids to have been opened Oct. 6, Industrial type concrete, masonry, prefabricated metal bldgs. with all utilities, K. I. Sawyer Air Force Base, Marquette, Mich. and Kincheloe Air Force Base, Mich. ENG-20-064-61-14, MICHIGAN. $700,000. Will re-advertise. CD 9/12.

▲ **MICHIGAN**—State Hy. Dpt., 732 Mason Bldg., Lansing, Zone 26, Bids opened 9/7,

Mich.—**Eisenhour Constr. Co. & H. L. Workman**, M-78, East Lansing, Mich., LB **$494,679**, 8.8 mi. wid'n. existing roadway M-60 from near Albion Rd. in Concord NE to Sandstone Creek, Jackson Co.;

Mich.—**Saginaw Asphalt Paving Co.**, 3200 Carrollton St., Saginaw, Mich., LB **$506,973**, 12.2 mi. wid'n. roadway and surf. M-13 from M-21 north to M-57, Genesee Co.;

Mich.—**Cooke Contg. Co.**, 116 Penobscot Bldg., Detroit, Mich., LB **$444,969**, 5.4 mi. surf. US 10 NW intermittently to Lincoln Ave., traffic betterment work at 17 locations US 10 in Birmingham, Royal Oak, Pleasant Ridge, Huntington Woods and Berkley, Oakland Co.;

Mich.—**Cooke Contg. Co.**, 1116 Penobscot Bldg., Detroit, Mich., **Rogers Constr. Co.**, 14836 Grand River Ave., Detroit, Mich., and **Jutton-Kelly**, 13240 Alber Ave., Dearborn, Mich., LB **$1,998,829**, 1 mi. Southfield freeway between Orangelawn and Schoolcraft Aves. incl. 3 bridges, two storm water pumphouses and utility alterations, Wayne Co., CD 8/29;

Mich.—**Max R. Frisinger**, 5804 W. Michigan St., Ann Arbor, Mich., LB **$248,184**, 3.7 mi. variable width surf. Telegraph Rd. US 24 from Northwestern Hy. north of north city limits of Southfield; south limits of Bingham Farms north to Maple Rd. and 12 Mile Rd., 13-Mile Rd. and West Long Lake Rd., Oakland Co., CD 8/29;

Mich.—**Ann Arbor Constr. Co.**, 221 Felch St., Ypsilanti, Mich., and **O. E. Godding**, 125 N. Normal St., Ypsilanti, Mich., LB **$169,853**, 6 mi. surf. M-72 east from point about 6.5 mi. east of Grayling, Crawford Co. CD 8/24;

Mich.—**O. E. Godding**, 125 N. Normal St., Ypsilanti, Mich., LB **$357,817**, 9.5 mi. reconstr. incl. grading, drainage structures and non-skid surf. M-90 from Peck east to M-51 in Croswell, Sanilac Co., CD 8/29;

Mich.—**Raff & Dexter**, Box 9517, Cedar St. Annex, Lansing, Mich., LB **$1,790,195**, almost 1 mi. Interstate 196 (US 16 freeway) from west bank of Grand River east to Cheney Ave. where it will connect with 14 mi. section, incl. bridge over Grand River and grade separations at Monroe, Coit and Cheney Aves., Kent Co. CD 8/29.

BUILDINGS—LB & CA

Tabasco Corp., 170 4th Ave., Nashville, Tenn., CA Approx. **$625,000**, OFFICE and WAREHOUSE, 1 story, bsmnt., 44,000 sq. ft. Laidlaw Ave., CINCINNATI, O., Ohio Tasco Inv. Corp., 170 4th Ave., Nashville, Tenn. Anthony Papuchis of Tasco Corp., Miami Rd., Nashville, Tenn., engr. Award Sept. 2.

▲ **Jewel Builders, Inc. & Honor Corp.**, 3497 E. Livingston St., Columbus, O., CA Est. **$4,000,000** aluminum and masonry APARTMENTS and HOUSES, Park Town Co-Operative Homes, CINCINNATI, O. Reynold Metals Co., 66014 Broad St., Richmond, Va. Doxiadis Assocs., 1757 K St. N. W., Wash., D. C., archts. Pepinsky, Grau, Schrand & Shorr, Third Bank Bldg., Cincinnati, O., assoc. archts.

▲ **Rzepka Constr. Co.**, 4913 Van Epps Rd., Cleveland, O., Owner Builds, **$1,500,000**, 72 HOMES in Plymouth Rd. section near W. Schaaf and Broadview Rds., CLEVELAND, O. Bertram S. Koslen, 16828 Kinsman Rd., Cleveland 22, O., archt.

▲ **Quality Built Homes**, Bedford Rd., Macedonia, O., Owner Builds, **$2,000,000**, HOMES, Cherokee Meadows Estates, Rt. 8, between Rte. 14 and 82, MACEDONIA, O.

W. B. Gibson Constr. Co., 200 Chestnut Ave. N. E., Warren, O., CA Est. **$900,000**, Howard Johnson MOTOR LODGE, Pool, at junction Rt. 422 and 46, NILES, O. Owner, c/o builder.

Talawanda Bd. Educ., Oxford, O., rejected bids Aug. 31, ELEMENTARY SCHOOL, addition to high school, OXFORD, O., **$560,000**, Will re-advertise. CD 1/20.

▲ **Zehman-Wolf & Sherman**, 13484 Cedar Rd., Cleveland 18, O., Owner Builds, **$3,500,000**, 156 HOMES, Parma Knolls development, Nottingham Rd., PARMA, O.

Sandusky Foundry & Machine Co., 615 W. Market St., Sandusky, O., Owner Builds, **$115,000**, PLANT addn. Sandusky, O.

Jas. McHugh Constr. Co., 6449 South Park Ave., Chicago, Ill., LB **$439,700**, INTERNES RESIDENCE addn., County Hospital, 720 S. Wood St., CHICAGO, ILL. Bd. Comrs., Cook Co., County Bldg., Chicago 2, Ill. Bids Sept. 6. CD 7/1.

▲ **Karl Slabaugh Builders**, 1123 Cambridge Blvd., Upper Arlington, O., CA Est. **$1,250,000**, 40 HOMES, Worthington Woods, 12-acre just north of Columbus on southern edge of WORTHINGTON, O. Helen & Jim Doyle Real Estate, 506 N. High St., Worthington, O. Dan McCartney, 3133 Saxon C. St., Columbus, O., archt.

Tonn & Blank, Inc., 104 N. Franklin, Michigan City, Ind., CA **$805,119**, (4 bidders), FACTORY and OFFICE, MICHIGAN CITY, IND. Royal Metal Mfg. Co. of Ill., c/o Ken Fryar Assocs., archts., First National Bank Bldg., E. Coolspring Ave., Michigan City, Ind. Bids Aug. 26, award Sept. 8.

Stengel Constr. Co., 258 E. Washington St., Jefferson, Wis. CA Est. **$345,000**, 2 story 47,500 sq. ft. FACTORY ADDN., JEFFERSON, WIS. Borg Fabric Corp., Jefferson, Wis. A. Kuenzli & R. Ebert, 202 N. Water St., Watertown, Wis., engrs. CD 12/24/58.

▲ **Fluor Bros. Constr. Co.**, 203 Otter Ave., Oshkosh, Wis. CA Est. **$1,000,000**. 100,000 sq. ft. FURNISHING ROOM, NIAGARA, WIS. Kimberly-Clark Co., Neenah, Wis. Bids Aug. 23. CD 8/16.

▲ **O. J. Boldt Constr. Co.**, 217 S. Badger Ave., Appleton, Wis., CA Est. **$1,000,000**, SCIENCE BLDG., RIPON, WIS., Ripon College, Ripon, Wis. CD 12/24.

Quasius Bros., Inc., 1716 N. 16th St., Sheboygan, Wis. CA Est. **$750,000** MOTEL, SHEBOYGAN, WIS. Mitchell-Foster Hotels Co., Ottumwa, Iowa. W. C. Weeks, Inc., 1518 Saemann Ave., Sheboygan, Wis., archt.

MISSISSIPPI TO ROCKIES

HEAVY CONSTRUCTION—BA

STATE HIGHWAY LETTINGS

BRIDGES

September 29 Kansas

STREETS AND ROADS

September 27 Colorado
September 29 Kansas
September 30 New Mexico

Minn., Herman—BA 9/27—Town, Town Hall, 308 Maple Grove Rd., 20,120 lin. ft. 12 in. water mains, etc. to connect with Duluth water sys. $100,000. Plans deposit $30. E. H. Ruble & Assocs., 519 Lyceum Bldg., Duluth, engrs.

† **South Dakota**—BA 9/29—U. S. Eng., 1709 Jackson St., Omaha 2, Neb., H road and crossing for Milwaukee R.R., Oahe Dam relocation, 1,000,000 cu. yd. excav., piping, riprap, etc., CIVENG-25-066-61-13. $500,000. Plans depoosit $2.10. CD 9/29/59.

Texas—TELEPHONE LINES—BA 9/29—Burnet Telephone Co., Pettus, telephone pole lines, near Pettus, $90,000. Southwestern Engineering Co., P. O. Box 278, Comfort, engr. CD 8/19.

Minn., St. Anthony—BA 9/30—Village, Village Hall, 6,500 lin. ft. 12- to 66-in. storm sewers. $88,000. Plans deposit $40. Comstock & Davis, Inc., 1446 County Rd. J, Minneapolis, Zone 21, engr.

Minn., St. Anthony (P. O. Minneapolis)—BA 9/30—Village, Village Hall, 26,000 sq. yd. concrete paving with integral curb, etc. $125,000. Plans deposit $30. Comstock & Davis, Inc., 1446 County Rd. J., Minneapolis, Zone 21, engr.

Minn., Milaca—BA 10/4—Mille Lacs County, grading, gravel surf. 2½ mi. CSAH 17 between CSAH 27 and south limits of Isle; 0.3 mi. CSAH 27 between CSAH 17, 2½ mi. south of south limits of Isle and 0.3 mi. south of CSAH 17; ½ mi. of CSAH 17 between point ½ mi. west of CSAH 27 and CSAH 27, 2½ mi. south of Isle. CSAHs 17 and 27.

Minn., Thief River Falls—BA 10/4—Pennington Co., grade, gravel surf. 4.4 mi. between Red Lake River and 8 mi. East and 1.3 mi. N. of High Landing. SP 57-627-01 (CSAH 27), Minn. Proj. S 6616 (4) and 3.7 mi. between 8 mi. E. and 1.3 mi. N. of High landing and TH 1, SE of Goodridge, SAP 57-627-02 (CSAH 27). $88,000. Plans deposit $1.70. J. Seidel, co. hy. engr.

BUILDINGS—BA

▲ **Minn., St. Anthony**—SCHOOL—BA 9/28—Bd. Educ. Independent School Dist. No. 283, Junior-Senior High School. $1,500,000. Plans deposit $35. Hamel & Green, Inc., 2650 University Ave., St. Paul, archt. CD 4/28.

▲ **Neb., Omaha**—MOTOR HOTEL—BA 10/13—Michael J. and Barton H. Ford, c/o Stanley J. How & Assocs., archts., 214 Swanson Bldg., 8401 Dodge, Omaha, Neb., (selected list bidders) Stage 1, Indian Hills Inn motor hotel, swimming pool, etc., 8501 West Dodge Rd. $3,000,000-$4,000,000. Plans deposit $100. CD 4/6.

(Continued on page 240)

BITUMINOUS DISTRIBUTOR — made by Municipal Supply Co., South Bend, Ind., and used by Mr. Gooch — spreads 18,000 gallons of material per day. It is Wisconsin-powered.
3 years and 3,000,000 gallons of bituminous spread later...

WISCONSIN ENGINE shows little wear

MODEL VG4D—25 to 37 hp.
Other models from 3 to 56 hp.

Take the word of an asphalt contractor—an air-cooled Wisconsin Engine is the low-cost power answer for a large bituminous distributor. But let Mr. W. E. Gooch, of Rochester, Ind., tell you why:

He used his Municipal Supply distributor three years running to apply about 3,000,000 gallons of asphalt cutback and road oils. At this time, "we took down the Wisconsin Engine, believing that it would certainly require some service," he states.

Upon removing the heads, he was surprised to find *no appreciable engine wear*. Since the heads were off, he had the valves ground — although this could have waited another season, he adds.

Here's proof that an air-cooled Wisconsin can beat the heat and the job. And you don't have to worry about dry-ups, freeze-ups, water, anti-freeze — nor about keeping radiators, fan belts, and other water-cooling parts clean.

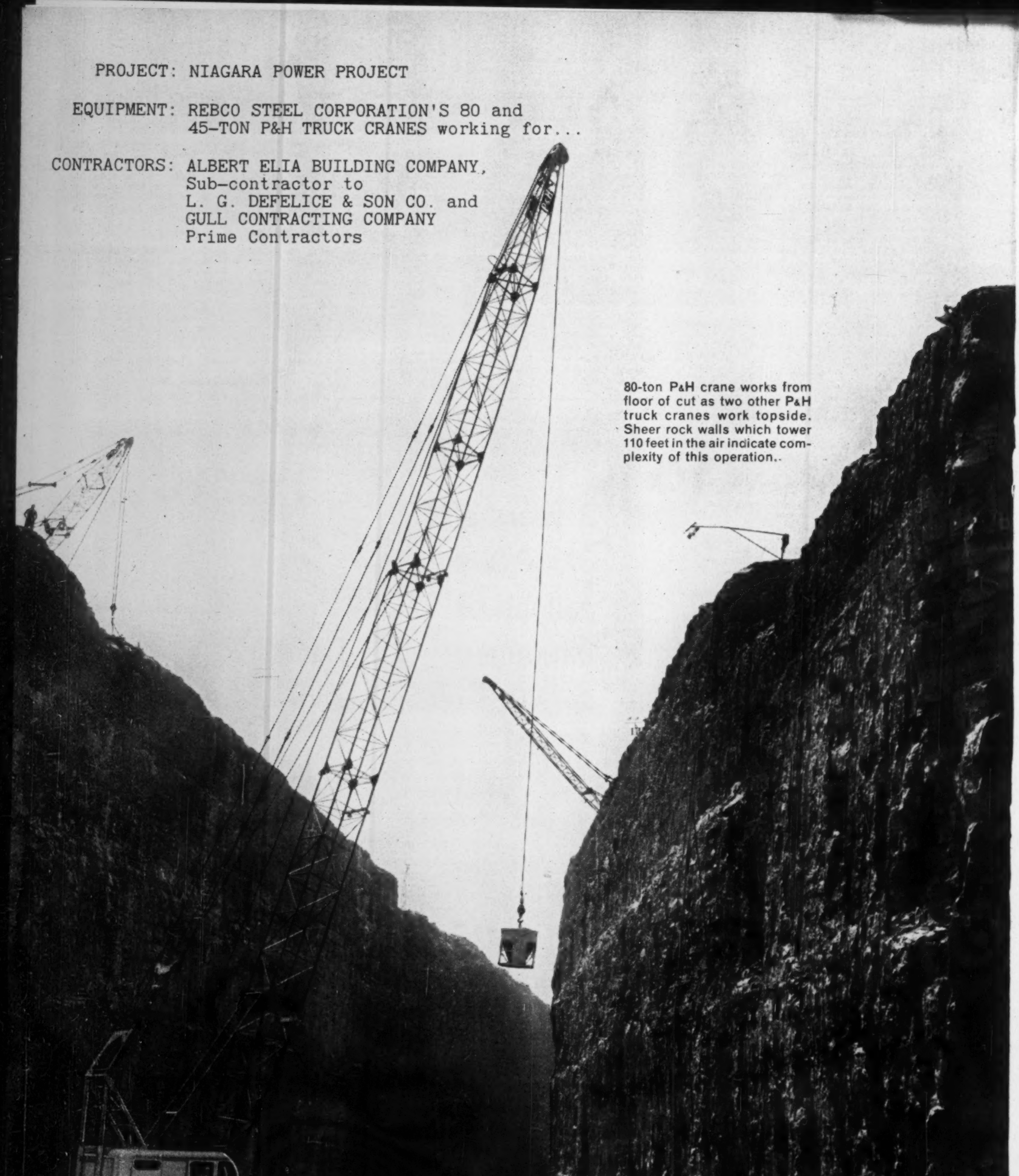
Be sure to specify heavy-duty air-cooled Wisconsin Engines on your construction equipment. Get Bulletin S-251. Write to Dept. C-10.

WISCONSIN MOTOR CORPORATION
MILWAUKEE 46, WISCONSIN
World's Largest Builders of Heavy-Duty Air-Cooled Engines
C-223

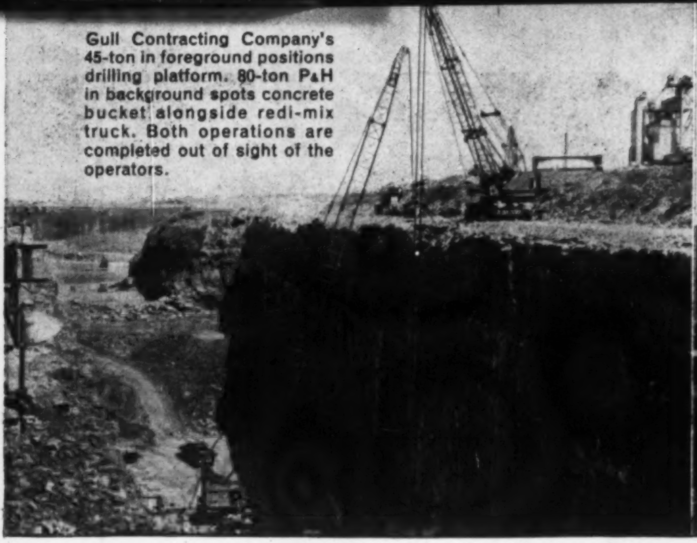
PROJECT: NIAGARA POWER PROJECT

EQUIPMENT: REBCO STEEL CORPORATION'S 80 and
45-TON P&H TRUCK CRANES working for...

CONTRACTORS: ALBERT ELIA BUILDING COMPANY,
Sub-contractor to
L. G. DEFELICE & SON CO. and
GULL CONTRACTING COMPANY
Prime Contractors



80-ton P&H crane works from floor of cut as two other P&H truck cranes work topside. Sheer rock walls which tower 110 feet in the air indicate complexity of this operation..



Gull Contracting Company's 45-ton in foreground positions drilling platform. 80-ton P&H in background spots concrete bucket alongside redi-mix truck. Both operations are completed out of sight of the operators.

45-ton P&H works on the very edge of the cut—here it is shown lowering steel reinforcing bars to floor.

3 P&H cranes help harness the mighty Niagara

Joe VeRost, Rebco Steel Corporation's Vice President reports—"*The unusual conditions here at Niagara forced Albert Elia to operate the 80-ton P&H from the floor of the 110-foot deep cut . . . picking up concrete from a point on top of the cut, out of sight of the operator . . . swinging it out and over and lowering it to the bottom for the pour. In my opinion this could not have been done without Magnetorque swing drive.*"

80-ton P&H "Feels in the Dark"

Sitting at the bottom of the cut and swinging 160 feet of boom, Rebco's 80-ton P&H truck crane reached up and over the 110 foot wall to pick up loaded 2-yard concrete buckets that were out of sight. It swung them smoothly and easily up and over the lip and lowered them to the floor, where it poured concrete in flat forms. This "out-of-sight" operation was controlled and directed by telephones between the operator and the concrete foreman. Pin-point positioning with 160 feet of boom—no simple task in itself—was made even more critical by the need to work this long boom "within inches" of the wall. It calls for extreme skill and smooth, immediate-action controls.

Mike Comerford, operator, praises Magnetorque—"Without Magnetorque controlled swing it would have been almost impossible to handle this job. With friction clutches, the boom whip would have been too violent—it would not have been possible to swing a few inches at a time. We have been making complete cycles in 2 minutes including pouring which required walking the bucket. To top it off we had to make 180 degree swings."

45-ton P&H works topside—fishes deep

Rebco's 45-ton P&H truck crane, sitting on the very edge of the 110 foot cut, constantly lowered reinforcing steel, equipment and concrete to the floor below. Operator Tom Wagner was also forced to operate "in the dark," receiving directions and instructions by phone. Tom Wagner says—"Smooth operation and accurate positioning of loads were possible with Magnetorque swing drive and immediate-action hydraulic control system of the P&H. They gave me more immediate control—and that's what we needed on this job."

45-ton P&H truck crane positions drilling rig

A 45-ton P&H, belonging to Gull Contracting Company, operated from the top of the cut where it supports a movable drilling platform some sixty feet down the side of the sheer wall. "Triple-safe" Planetary Boom Hoist assured positive holding of the platform as holes were drilled in the side of the rock wall for steel reinforcing bars. The P&H lowered or raised the platform to new positions as soon as the holes were drilled.

P&H gives unmatched performance

Rushing for completion of this huge project, contractors are putting men and equipment to extreme tests. Operating a two-shift program of ten hours each, the P&H truck cranes are used constantly, twenty hours out of the twenty four . . . six days out of the week. Under extreme endurance tests like this, P&H durability and ruggedness stand out . . . actually deliver more working time on the job.

For complete information on this job, write for Case History 121 or contact your P&H dealer for detailed facts on the complete line of P&H truck cranes.

HARNISCHFEGER

Milwaukee 46, Wisconsin

P&H
CONSTRUCTION & MINING DIVISION

CIRCLE 239 ON READER SERVICE CARD

ACROW V FORM

Complete slab-forming SYSTEM gives you

POSITIVE... AUTOMATIC... INSTANTANEOUS ALIGNMENT

and they save as much as

45% ON LABOR COSTS

SYSTEM consists of only three basic parts: an ACROW SHORE, a support beam and a form panel. All three can be quickly assembled by any inexperienced workman. Nothing can possibly go wrong in the assembly; there is nothing that can come loose.

ACROW V FORM gives you speed, rigidity and safety in one combination. They are made in standard component sizes for every type of slab construction... Get all the facts.

Send for Literature

ACROW CORPORATION OF AMERICA
231 WASHINGTON AVENUE, CARLSTADT, N. J.
In New Jersey: Phone WEbster 3-0450
In New York: Phone LOngacre 4-8753

ACROW Denver, Inc., 1035 So. Huron St.
Denver, Colorado • Phone SP 7-5486

NEW YORK · CHICAGO · DENVER · TORONTO · MONTREAL

CIRCLE 59 ON READER SERVICE CARD

GET MORE FOR YOUR MONEY WITH A WARREN-KNIGHT Transit

After all, an instrument with a design and construction that assures more work in less time, with reduced maintenance and repair costs, and will probably be considered your "Number one" instrument during your entire remaining Professional career, certainly merits your serious consideration.

Model 2cF
$775.00

10 DAY FREE TRIAL SHOWS WHY

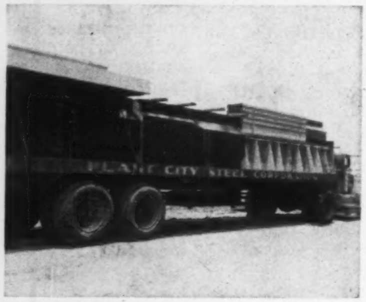
Sturdier Construction, with extra reinforcing for rough handling, means longer life. Close Focus at 4½ feet saves many a set-up. Disappearing Stadia eliminates source of errors in running levels. Right Angle Peepsight through telescope axle permits offsets at close range. Differentiated Size and Slant of figures on limbs and vernier assures accurate reading. Replaceable Leveling Screws reduce maintenance. Noncramping Leveling Head assures easy handling.

OUR 52nd YEAR

Ask for Bulletin NR-90 that lists full details.

WARREN-KNIGHT
136 N. 12th St., Phila. 7, Pa.

CIRCLE 240 ON READER SERVICE CARD



Another Truckload of WATCO STEEL FORMS departing on schedule

Send coupon below for illustrated catalog on our complete form line

P. O. Box 1308 • Plant City, Florida
☐ Please have rep. contact us
☐ Please send catalog
Name________________
Firm________________
Address________________

watco STEEL FORMS
DIVISION OF PLANT CITY STEEL CORPORATION

CIRCLE 46 ON READER SERVICE CARD

(Continued from page 237)

† **N. M., Los Alamos**—HOUSING REMODELING—BA 10/18—U. S. Atomic Energy Comn., Contracts & Procurement Station, housing remodeling, Phase B, Inv. No. 291-61-1. $500,000-$600,000. CD 7/29/59.

Tex., Brownsville—HOSPITAL—BA About 10/27—Mercy Hospital, 1040 W. Jefferson St., hospital addn., imprvs., $750,000-$1,250,000. CD 3/16.

HEAVY CONSTRUCTION—LB & CA

Stanfield-Pyland Constr. Co., Spencer, Iowa, LB **$324,000**, est. $300,000, (1 bidder) sanitary sewerage system, sewage treatment plant, PLEASANT HILL, IOWA. Town, Town Hall, Pleasant Hill, Iowa. Bids Aug. 22. CD 8/17.

MISSOURI—State Hy. Dpt., Jefferson City,
Mo.—**Fred Weber Contr., Inc.**, 7929 Alabama Ave., St. Louis 11, Mo., CA **$918,051**, grading, culverts 3.504 mi., St. Louis Co., CD 9/2, under LB; CA **$90,574** highway lighting, St. Louis Co. CD 8/3 under LB; CA **$148,265**, grading, br. and RR track relocation 1.001 mi., St. Louis Co.;

Mo.—**Bowen Constr. Co.**, 3200 Fairmount St., Kansas City, Mo., CA **$642,452** graded earth, culverts 7.486 mi., Ralls Co.;

Mo.—**Runquist Co.**, Savannah, Mo., CA **$119,231** graded earth, shouldering, culverts 9.253 mi., Pemiscot Co. CD 9/29 under LB. Bids Aug. 25, awarded Aug. 29. Grand total $1,918,573.

▲ **ARKANSAS**—Arkansas State Hy. Comn., Capitol, Little Rock,

Reynolds & Williams, 3200 Brown St., Little Rock, Ark., CA **$1,596,602**, 6.493 mi. road construction on Interstate Hy. 30, Hot Spring and Saline Counties. CD 9/2, under LB.

R. D. Cole Mfg. Co., 57 E. Broad St., Box 576, Newman, Ga., CA **$86,180**, elevated water storage tank, CONWAY, ARK., City, City Hall, Conway, Ark. Marion Chist Assocs., 4324 W. Markham St., Little Rock, Ark., engrs. CD 8/31.

Barnard-Curtiss Co., 1010 Soo Line Bldg., Minneapolis 2, Minn., CA **$369,775**, (3 bidders), sub-impoundment Spring Creek; embankment rip-rap, gravel surfacing, piping and guide posts, Oahe Reservoir, CIVENG-25-066-60-123, Pollock Co., SOUTH DAKOTA. U. S. Eng., 1709 Jackson St., Omaha 2, Neb. Bids July 21, awarded Sept. 8. CD 9/2.

KANSAS—State Hy. Comn., Phillipsburg,

Harry Henery, Inc., Box 15, Ottawa, Kan., CA **$412,206** (5 bidders) grading 11.397 mi. 36-74 F 092-2 (14), Phillips Co. Bids Sept. 1. CD 8/12.

KANSAS—State Hy. Comn., State Office Bldg., Topeka,

Kan.—**N. R. Hamm**, Perry, Kan., CA **$107,379** (1 bidder) grading, A-B base course 1.001 mi. R-AD-9(3) Pt. I, Douglas Co.;

Kan.—**Blacktop Constr. Co., Inc.**, Box 328, Emporia, Kan., CA **$190,635** (3 bidders) grading, A-B base course 2.544 mi. R-AD-9(6), Lyon Co. ;

Kan.—**Reno Constr. Co., Inc.**, Box 61, Overland Park, Kan., CA **$253,744**, (3 bidders) grading, A-B base course 3.94 mi. R-AD 9(9), Jackson Co.;

Kan.—**Swenson Constr. Co.**, 3305 Terrace St., Kansas City, Mo., CA **$165,971**, (3 bidders) concrete pavement 1.309 mi. SP 69-46 F 083-3(11) Johnson Co. Bids Sept. 8. Grand total $717,729. CD 8/25.

KANSAS—State Hy. Comn., State Office Bldg., Topeka, rejected bids Sept. 8, A-A base course 6.435 mi. SP 77-64 F 055-3(18) Pts. I&II, Morris Co. CD 8/25.

▲ **Metropolitan Paving Co.**, 300 South Indiana St., Oklahoma City, Okla., LB **$119,476**, est. $121,760, grading, asphalt paving in District 1394, OKLAHOMA CITY, OKLA. City, City Hall, Oklahoma City, Okla. W. W. Baker, City Hall, Oklahoma City, Okla., engr. CD 7/27/55.

Hiller & House, Jourdanton, Tex., CA **$87,262**, building Floodwater Retarding Dam No. 1, Taylor, TEXAS. Brushy Creek Watershed, P. O. Box 1183, Taylor, Tex. Bids 8/29. CD 8/24.

▲ **H. B. Shanks & Son, Inc.**, Alice, Tex., CA **$1,088,000**, 31 mi. 16 in. gas line and feeder lines from Zapata to Rio Grande City, Zapata and Starr Counties, TEXAS. Natural Gas Gathering Co., subsidiary Delhi-Taylor Oil Corp., Corrigan Tower Bld., Dallas, Tex., and Gulf Resources, Inc., Petroleum Center, San Antonio, Tex. CD 6/17/55.

Southwestern Bell Telephone Co., 308 S. Akard St., Dallas, Tex., Owner Builds, **$125,000**, telephone lines, Tanglewood Hills of Lake Texoma, TEXAS. CD 9/7.

▲ **Sharman, Allen, Gay & Taylor**, Vayou Bldg., Houston, Tex., CA **$2,785,000**, 60 mi. 30 in. gas pipeline, between Bloomsburg Tex. and Hope, Ark., TEXAS-ARKANSAS. Peoples Gulf Coast Natural Gas Pipeline Co., Hope, Ark.

W. F. Nuss, Jr., Commerce, Tex., Owner Builds, **$75,000**, earthwork, floodgate, unitization, Sipe Springs field, COMANCHE, TEX. CD 9/8.

Tennessee Gas Transmission Co., Tennessee Bldg., Houston, Tex., Owner Builds, **$325,000**, piling for bulkheading channel behind 3,300 ft. of wharf, piling for bulkheading channel behind 1,500 ft. wharf, HOUSTON, TEX.

▲ **Lawless & Alford**, P.O. Box 600, Austin, Tex., CA **$2,138,849**, modernize and air-condition 20 dormitories, Sheppard Air Force Base, Inv. No. 41-612-60-127, WICHITA FALLS, TEX. U. S. Base Procurement Office, Bldg. 102, Sheppard Air Force Base, Wichita Falls, Tex. Bids 6/28. CD 6/16.

COLORADO—State Hy. Dpt., 4201 E. Arkansas, Denver, Colo.—**A. A. Horner Constr. Co.**, 118 S. Pecos St., Denver, Colo., CA **$427,210**, est. $416,000 (6 bidders), structures and approaches, total length being 0.092 mi., located on Interstate Rte. 80S, Morgan Co.;

Colo.—**Gardner Constr. Co.**, Glenwood Springs, Colo., LB **$239,129**, est. $164,000 (9 bidders), structures and grading, 3.686 mi. Colo. Proj. No. S 0124(13), Saguache Co. Bids Sept. 8. CD 8/25.

Westwood Constr. Co., 3940 Morrison Rd., Denver, Colo., LB **$499,490**, est. $477,358, Micro Strainer Plant at Marston Lake, near DENVER, COLO., Bd. Water Comrs., 144 West Colfax, Denver, Colo. CD 8/25.

▲† **W. & L. Construction Co.**, P. O. Box 3987, Oklahoma City, Okla., LB **$1,993,750**, modernizing dormitories, Lowry Air Force Base, IFB-05-600-60-124B, DENVER, COLO. Base Procurement Office, Lowry Air Force Base, Denver, Colo. Bids July 8. CD 6/20.

BUILDINGS—LB & CA

A. Hedenberg & Co., 4621 E. Superior St., Duluth, Minn., CA **$493,700**, CLASSROOM BLDG., Duluth Branch, DULUTH, MINN. Regents of the University of Minnesota, 404 Administration Bldg., Minneapolis 14, Minn. Bids Aug. 30. CD 9/7, under LB.

Kraus-Anderson, Inc., 501 S. Eighth St., Minneapolis, Minn., LB **$397,810**, (6 bidders) 3 floors, roof PARKING RAMP, MINNEAPOLIS, MINN. National Garages, Inc., Soo Line Bldg., Minneapolis, Minn. Bids Sept. 8.

N. Johnson Constr. Co., 677 Main St., Winona, Minn., LB **$861,000**, 2 story, bsmnt., 139 x 193 ft. with 63 x 116 ft. wing, STUDENT CENTER, DECORAH, IOWA. Luther College, Decorah, Iowa. Bids Sept. 1. CD 8/24.

Meinecke & Johnston Co., Box 1446, Fargo, N. D., CA **$741,645**, 4 story, part bsmnt., 50 x 217 ft. HOSPITAL addn., FARGO, N. D. Saint Luke's Hospital, 727 Broadway, Fargo, N. D. Foss & Co., 28 N. 3rd St., Moorhead, Minn., archts. Bids Aug. 9. CD 9/1.

Scheffe Constr. Co., Box 22251, Houston, Tex., CA **$775,790**, JUNIOR HIGH SCHOOL, ALDINE, TEX. Aldine Ind. School Dist., 14910 Aldine-Westfield-Hillcrest Rds., Aldine, Tex. CD 9/15.

Hal C. Dyer, Lone Star Gas Bld., Dallas, Tex., LB **$463,800**, Bid No. 1, graduate RESEARCH CENTER, DALLAS, TEX. Southern Methodist University, Dallas, Tex. Bids Sept. 6. CD 8/30.

Centennial Constr. Co., 11111 N. Central Expressway, Dallas, Tex., Owner Builds, **$441,200**, 36 DWELLINGS, "Enchanted Village" Subdivision, DALLAS, TEX. CD 5/13.

Texmo Corp., **Floyd Stone**, Denison, Tex., Owner Builds, **$465,500**, 35 DWELLINGS, near Industrial Park, DENISON, TEX.

▲ **Locher Constr. Co.**, 1932 Bissonnet St., Houston, Tex., Owner Builds, **$600,000**, APARTMENT; **$1,350,000**, 10 story APARTMENT, 4th and Mechanic, GALVESTON, TEX. CD 6/10.

Centennial Constr. Co., 11111 N. Central Expressway, Dallas, Tex., Owner Builds, **$828,000**, 54 DWELLINGS, Enchanted Village Subdivision, GARLAND, TEX. CD 9/15.

King Constr. Co., 3818 Chaffin St., Houston, Tex., CA **$829,124**, 71 DWELLINGS, Intersection Aldine-Mail Rd., HOUSTON, TEX. Bayou Homesites, Inv. 9546 Meadowbriar St., Houston, Tex.

▲ **Nelson Puett & Associates, Developers**, 6427 Richmond Rd., Houston, Tex., Owner Builds, **$2,150,000**, 84 DWELLINGS, 4th Sec. Braeburn Valley Subdivision, HOUSTON, TEX. CD 5/2;
Texola Constr. Co., 6427 Richmond Rd., Houston, Tex., CA **$147,145**, street and water lines, Sec. 4, Braeburn Valley (Houston, Tex.).

▲ **Wilkins Co., Inc.**, Box 286, Boulder, Colo., CA **$1,083,311** (12 bidders), 1 story, brick, stone, steel frame, 25 classrooms, auditorium seat approx. 550, JUNIOR-SENIOR HIGH SCHOOL, CASTLE ROCK, COLO. School Dist. RE-1, 620 Wilcon, Castle Rock, Colo. Albert McKittrick, 973 Lincoln, Denver, Colo., elec. engr. Harmon & Beckett, 2243 W. 32nd, Denver, Colo., mech. engr. Russell Kostroski, 2219 W. 32nd Denver, Colo., struc. engr. Bids Aug. 24, awarded Sept. 2. CD 8/29, under LB.

State Planning Div., State Capitol, Denver, Colo., rejected bids Sept. 1, remodeling barracks for MENTAL HOSPITAL, FT. LOGAN, COLO., LB **$614,567**. CD 9/9, under LB.

FAR WEST

HEAVY CONSTRUCTION—BA

STATE HIGHWAY LETTINGS

BRIDGES

October 4 Washington October 13, 21 California

STREETS AND ROADS

September 30 Arizona October 3 Alaska
October 4 Washington October 13, 14 California

Calif., Los Angeles—BA 10/7—Los Angeles County Flood Control Dist., 2250 Alcazar St., Proj. 516 and Proj. 423 line C, Unit 2, rein.-con. storm drain, San Dimas and Covina. $317,220. Plans deposit $2.60. CD 11/10/58.

▲† **Wash., Blaine**—RADAR TOWER—BA 10/11—U. S. Eng., 1519 S. Alaskan Way, Seattle, Zone 4, 85 ft. high radar tower, 61x61 ft. incl., 5 floors, with air-conditioned steam htg., rein.-con. bldg. for FD radar facilities, FPS 24/24, Blaine Air Force Station, ENG-45-108-61-26. Extended date, CD 8/30.

▲ **Calif., Sacramento**—BA 10/27—City, 9 ond I Sts., water treatment facilities, Sacramento River near 10 Ave. and Riverside Blvd. $1,800,000. CD 11/9.

BUILDINGS—BA

Wash., Bellevue—HIGH SCHOOL—BA 10/3—School Dist. 405, Bellevue, 34,000 sq. ft. masonry, frame Sammamish High School addn., rein.-con. fdn. $600,000. Plans deposit $50. Naramore, Bain, Brady & Johanson, 904 7th Ave., Seattle, Zone 4, archts. CD 6/30.

▲ **Wash., Cheney** — SCIENCE — BA 10/11 — Eastern Washington College of Education, 2 story, 100,000 sq. ft. rein.-con. science bldg. $2,000,000. Plans deposit $50. G. M. Rasque & Son, Washington Trust Bldg., Spokane, archts. CD 11/19.

HEAVY CONSTRUCTION—LB & CA

WASHINGTON—State Hy. Comn., Transportation Bldg., Olympia,

Hannan Bros. Co., 8410 S.E. Oety Rd., Portland, Ore., CA **$357,755**, est. $397,000, (4 bidders), r x box girder approach spans on 0.125 mi. Primary State Hy. 12 for east approach to Cowlitz River bridge near Longview, FA No. F-001-1(32), Cowlitz Co. Bids Sept. 7. CD 8/16, under Streets and Roads.

▲ **WASHINGTON**—State Hy. Comn., Olympia, Bids opened 9/13,

J. J. Welcome Constr. Co., Redmond, Wash., LB **$1,076,913**, constr. 6.773 mi. Primary State Hy. 2, Hobart Rd. to Echo Lake. CD 8/24.

▲ **WASHINGTON and OREGON**—State Hy. Comn., Dpt. Hys., Olympia, Wash.,

Paul Jarvis, Inc., 1070 West Ewing, Seattle, Wash., CA **$2,409,163**, bridge over Columbia River, at Biggs Rapids, Klickitat Co., Wash., and Sherman Co., Ore. Bids Sept. 9, CD 9/14, under LB.

† **Pacific Concrete Co.**, 10401 NE Marx, Portland, Ore., LB **$503,334**, earthwork, concrete lining and structures for Talent lateral rehabilitation, Sta. 142 plus 50 to 1037 plus 12, Rouge River Basin Proj., DC-5377, OREGON, Bureau Reclamation, Dpt. Interior, White City, Ore. Bids Sept. 7. CD 8/1.

▲ **CALIFORNIA**—State Div. Hys., 120 Spring St., Los Angeles, Bids opened 9/8,

V. R. Dennis Constr. Co., P.O. Box 3158, Hillcrest Station, San Diego, Calif., LB **$2,988,425**, (5 bidders), 5.4 mi. four-lane freeway State Sign Rte. 78 between ½ mi. west of Rancho Santa Fe Rd. and east of Nordahl Rd., near Recondido, incl. 7 traffic separation bridges, XI-S.D.-196-B, San Diego Co. CD 8/10.

▲ **CALIFORNIA**—State Div. Hys., 1120 N St., Sacramento, Bids opened 9/14,

Piombo Constr. Co., P. O. Box 607, San Carlos, Calif., LB **$2,635,394**, (5 bidders), grading, paving 2.6 mi. four lane freeway U.S. 50 between Washington St., Placerville and railroad crossing east of City at Smith Flat Rd., incl. 5 structures, El Dorado Co. CD 8/17.

Martin Kordick, 914 S. Shamrock, Monrovia, Calif., LB **$357,814**, (10 bidders), storm drain, Ball Rd., ANAHEIM, CALIF. City, City Hall, Anaheim, Calif. Bids Aug. 4. CD 5/3.

▲ **Utah Constr. & Mining Co.**, 100 Bush St., San Francisco, Calif., CA **$5,200,000**, main passenger terminal, Oakland International Airport, OAKLAND, CALIF. Oakland Port Comn., Grove St. Pier, Oakland, Calif. Bids Sept. 12. CD 9/2.

BUILDINGS—LB & CA

▲ **T. C. K. Constr. Co.**, 2750 W. McDowell Rd., Phoenix, Ariz., CA **$1,182,740**, "College of Education" CLASSROOM BLDG., Arizona State University, TEMPE, ARIZ. Bd. Regents of Arizona Universities, Phoenix, Awarded Sept. 7. CD 7/27/54.

Julian Weinstock Constr. Co., Inc., 8621 Wilshire Blvd., Beverly Hills, Calif., Owner Builds, **$939.000**, 4 story HOTEL, 8300 Sunset Blvd., LOS ANGELES, CALIF. Herbert R. Kameon, 227 S. Roberston Blvd., Beverly Hills, Calif., archt.

▲ **Guy E. Hall**, Box 1086, Bakersfield, Calif., CA **$1,456,380**, four BUILDINGS, Allan Hancock College, SANTA MARIA, CALIF. Santa Maria Junior College Dist., 901 S. Broadway, Santa Maria, Calif. Bids Aug. 12. CD 7/29.

CANADA

HEAVY CONSTRUCTION—BA

STATE HIGHWAY LETTINGS

STREETS AND ROADS

September 28, October 2, 5, 12 Ontario
September 29 Quebec

BUILDINGS—BA

Que., Beaconsfield—CORRECTION SCHOOL—BA 9/28—Sisters of the Good Shepherd, 288 Beaconsfield Blvd., Beaconsfield, Correction School for girls, Golf Ave. $600,000. Franco Consiglio, 1201 Guy St., Montreal, archts. Brouillet & Carmel, 3600 Barclay Ave., Montreal, consult. engrs. CD 4/4.

B. C., Dawson Creek—HIGH SCHOOL—BA 9/30—School Dist. 59 (Peace River Sth.), 1029B-105 Ave., 2 story, frame Elementary-Junior-High School, $525,000. Plans deposit $50. G. A. Killick, Ste. 3, Royal Bank Bldg., 10th St., archt. Swan, Wooster Engineering Co. Ltd., 1334 W. Pender, Vancouver, engrs.

▲ **Que., Montreal**—BANK—BA 9/30—Bank of Nova Scotia, 44 King St. W., Toronto, Ont. (selected list of bidders), bank reconstruction, extension, 437 St. James St. W. $4,000,000. Extended date. CD 9/2.

Ont., Toronto—SPORTS ARENA—BA 10/7—City, City Hall, 181 x 261 ft. poured concrete fdn., precast concrete, brick, structural steel in upper level, concrete block interior walls, steel frame, George Bell Sports Arena. $600,000. Plans deposit $100. Somerville, McMurrich & Oxley, 191 Eglinton Ave. E., archts.

Que., Montreal—POLICE STATION—BA 10/12—City, City Hall, 2 story, T-shape, 32 x 69 x 186 ft. police station, rein.-con. frame, stone, 47 x 38 ft. maintenance bldg., etc., Mount Royal Park. $500,000. CD 3/27/59.

BUILDINGS—SLC

Ont., Ottawa—OFFICE, etc.—Kaladar Realty Ltd., c/o Morris J. Woolfson, archt., 104 Lewis St., soon lets contract 1 story, mezzanine, 247 x 274 ft., brick, block, structural steel frame, office and warehouse, Michael St. $400,000.

HEAVY CONSTRUCTION—LB & CA

C. W. Carry Ltd., 10530-103 St., Edmonton, Alta., CA **$846,200**, structural steel and steel decking for Terminal Building, Edmonton International Airport, EDMONTON, ALTA. Dpt. Transport, Hunter Bldg., Ottawa, Ont. Bids Aug. 4. CD 8/19.

Interior Contracting Ltd., Penticton, B. C., LB **$858,000**, sewers, PENTICTON, B. C., Municipality of Penticton, Penticton, B. C.

▲ **Drake Constr. Co. Ltd.**, 155M-1485 Portage Ave., Winnipeg, Man., LB **$1,290,600**, (11 bidders), power house for Air Terminal Bldg., International Airport, WINNIPEG, MAN. Dpt. Transport, Hunter Bldg., Ottawa, Ont. CD 8/15.

ONTARIO—Dpt. Hys., Parliament Bldgs., Downsview, Bids opened 9/7.

Peel Constr. Co. Ltd., Box 1000, Brampton, Ont., LB **$522,359**, grading, granular base and hot mix paving 6.6 mi. Hy. 7 from Hy. 10 to Georgetown, Proj. 60-10, Georgetown. CD 8/11.

Dufferin Constr. Co., Ltd., 2700 Dufferin St., Toronto, LB **$575,685**, pavement reconstruction and street widening various streets, asph. b. conc. pavement on concrete base, TORONTO, ONT. Municipality of Metropolitan Toronto, 67 Adelaide St. E., Toronto, Ont. CD 8/30.

BUILDINGS—LB & CA

▲ **Bird Constr. Co., Ltd.**, 12525-127th Ave., Edmonton, Alta., CA **$2,205,500**, COMPOSITE HIGH SCHOOL JASPER PLACE, ALTA. West Jasper Place School District No. 4679, Jasper Place, Alta. CD 8/30 under LB.

▲ **Smith Bros. & Wilson Ltd.**, 1267 Richards, Vancouver, B. C., CA **$1,974,454**, est. $2,000,000, 237,000 sq. ft., hardware WAREHOUSE and 54,000 sq. ft. OFFICE, rein.-con., prestressed concrete, concrete block, VANCOUVER, B. C. McLennan, McFeely & Prior, 99 East Cordova St., Vancouver, B. C. McCarter, Nairne & Partners, 355 Burrard St., Vancouver, B. C., archts.-engrs.

▲ **Luney Bros. & Hamilton Ltd**, Victoria, B. C., LB **$1,686,000**, Victoria LAW COURTS, VICTORIA, B. C. Govt. of British Columbia, Parliament Bldgs., Victoria B. C. CD 2/24.

▲ **Stephens Constr. Ltd.**, Townsend St., Sydney, N. S., CA **$1,495,000**, HOSPITAL and NURSES' HOMES, NEW WATERFORD, N. S. Consolidated Hospital Comn., New Waterford, N. S. Bids July 8. CD 8/8.

▲ **Ellis Don Constr. Co.**, Box 852, London, Ont., CA Est. **$1,000,000**, 3 story, 90,000 sq. ft. brick, steel, PLANT addn. and OFFICES, LONDON, ONT. Kellogg Co. of Canada Ltd., 1097 Dundas St., London, Ont. Bids Sept. 6, awarded Sept. 12. CD 8/19.

▲ **Toronto Bd. Educ.**, 155 College St., Toronto, Ont., cancelled bids to have been opened Sept. 29, concrete, frame, masonry exterior, Davisville PUBLIC SCHOOL and Metropolitan SCHOOL for the Deaf, TORONTO, ONT. **$1,200,000.** Will re-advertise. CD 9/12.

▲ **Toxford Construction Co. Ltd.**, 121 Richmond St., W., Toronto, LB **$1,235,949**, (7 bidders), low rental HOUSING, Halton Ave., TORONTO, ONT., Municipaicy of Metropolitan Toronto, 67 Adelaide St. E., and Welfare & Housing Dpt., 350 Christie St., Toronto, Ont. CD 8/23.

Brockenshire Constr. Ltd., 1922 Wyandotte St., E., Windsor, Ont., CA **$448,161**, (9 bidders), HOSPITAL addn., alterations, WINDSOR, ONT. Metropolitan General Hospital, 1995 Lens Ave., Windsor, Ont. Pennington & Carter, 302 Morris Block, Windsor, Ont., archts.

▲ **Foster Wheeler Ltd.**, P. O. Box 429, St., Catharines, Ont., CA Est. **$2,500,000**, Aromatics extraction PLANT, at Montreal East Refinery, MONTREAL EAST, QUE., British American Oil Co., Ltd., 1945 Graham Blvd., Town of Mount Royal, Que. Awarded Sept. /60.

R. E. Stewart Constr. Co., 5890 Monkland Ave., Montreal, Que., LB **$537,161**, (10 bidders), SCHOOL, Gilmour and Gouin Blvd., "Stonecroft," MONTREAL, QUE. Protestant Board of School Comrs. of St. Laurent, c/o F. David Mathias, 1375 Greene Ave., Westmount, Que., archts. De Stein & Associates, 4147 Sherbrooke St. W., Montreal, Que., engrs.

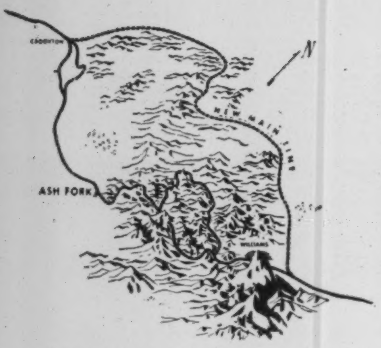
▲ **Iberville Constr., Inc.**, 4995 Bellechasse St. E., Montreal, Que., CA **$1,125,000**, 1 story, rein.-con. frame, brick walls, HOSPITAL, REPENTIGNY, QUE. L'Hopital Le'Gardeur 518 Notre Dame St., Repentigny, Que. CD 8/19, under LB.

AMERICANS ABROAD

BUILDINGS—LB & CA

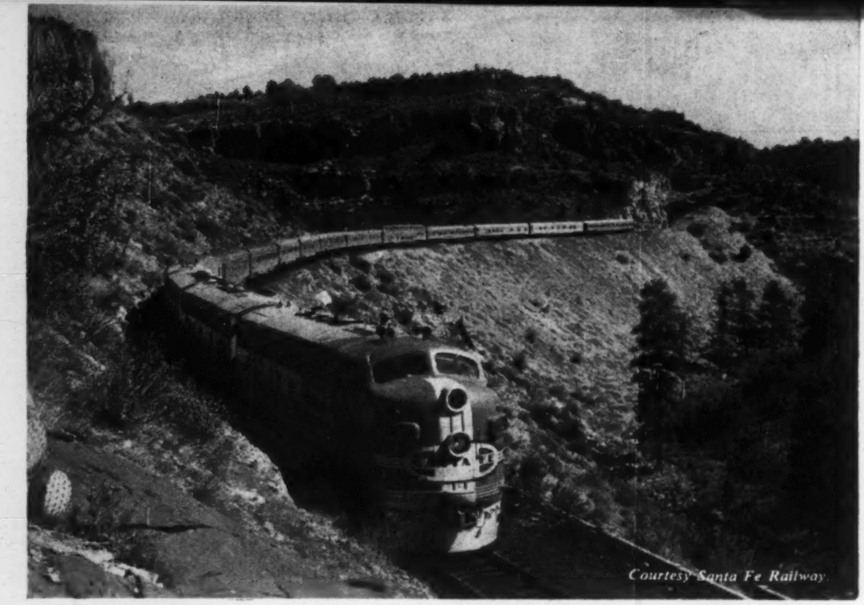
▲ **Societa Generale Immobilare**, c/o Hilton Hotels International, Inc., 301 Park Ave., New York 22, N. Y., U.S.A., Owner Builds, **$6,000,000**, 6 story, 414 double bedroom The Cavalieri HOTEL, 15 acres, Monte Mario section, ROME, ITALY. Skidmore, Owings, Merrill, 425 Park Ave., New York 22, N. Y., U.S.A., archts. CD 11/30/50.

(Proposal Advertisements see pp. 253 to 255)



Old Main Line (solid) from Williams to Crookton, Arizona, is approximately 44 miles long. Built in 1883: note the tortuous route east of Ash Fork which also contains the Johnson Canyon tunnel. Modern railroading is impracticable.

New Main Line (dotted) covers the same distance but will save at least one hour on freight train runs. Modern railroading is assured — with the uniform 1% grade and 1° curves permit the use of continuously welded rail.


Courtesy Santa Fe Railway

Santa Fe Chief winds through the ruggedness of Johnson's Canyon, near Williams, Ariz..

Primacord® helps Morrison-Knudsen move 5 1/2 million cubic yards of rock

"Cuts" as deep as 125 feet and "fills" as high as 120 feet will provide a 1% grade for the Atchison, Topeka & Santa Fe Railway from Williams to Crookton, Arizona

It couldn't be done in 1883 when the line was laid out. They had dynamite and safety fuse but the rock had to be moved in dinky cars and horse-drawn wagons. So, the Santa Fe settled for 10° curves, 1.42% grades and a tunnel . . .

By January 1961, fast freight and passenger trains will move over a new roadbed, carved out of some of the toughest rock in the West – malpais, a volcanic formation hard to drill, hard to shoot.

But Morrison-Knudsen is two months ahead of schedule. They are using a blasting technique in which Primacord plays a vital part. Three-inch holes are drilled on an average 6' x 6' pattern to a depth of 30 feet in the deeper cuts. As many as 18 rows of holes are used in an initial cut 125 feet above the final roadbed. Holes are loaded with 60% Extra Dynamite with "Gianite" blasting agent or AN prills and fuel oil in dry work.

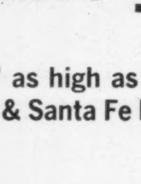
All holes are initiated with Reinforced Primacord, hooked up to Primacord trunklines so that the center of the cut fires instantaneously. Primacord M/S Connectors are tied into the trunkline system to provide millisecond delay firing of the outer rows of holes.

This blasting method has resulted in many advantages. Holes can be primed and loaded soon after drilling is completed with minimum danger of prematures. After the complete shot is hooked up, a single electric blasting cap, attached to one end of the trunkline – *only when all is ready for the blast* – detonates the entire shot. The method provides excellent rock displacement for easy, fast digging, with minimum slope overbreak. Very little secondary blasting is needed.

Primacord Detonating Fuse is insensitive to sparks, normal vibration, and stray electrical currents. Even a direct hit by lightning has failed to detonate it. When initiated with fuse and cap or electric blasting cap, it produces a detonation wave that travels throughout its length at a speed of approximately four miles per second. It will initiate any cap-sensitive explosive with which it comes in contact.

With Primacord you can prime all the explosives in a hole, and connect all holes in a blasting pattern designed to meet your needs.

Use Primacord to promote safety, speed operations, improve production and profits.


PRIMACORD-BICKFORD
DETONATING FUSE
What it is and how to use it
THE ENSIGN-BICKFORD COMPANY

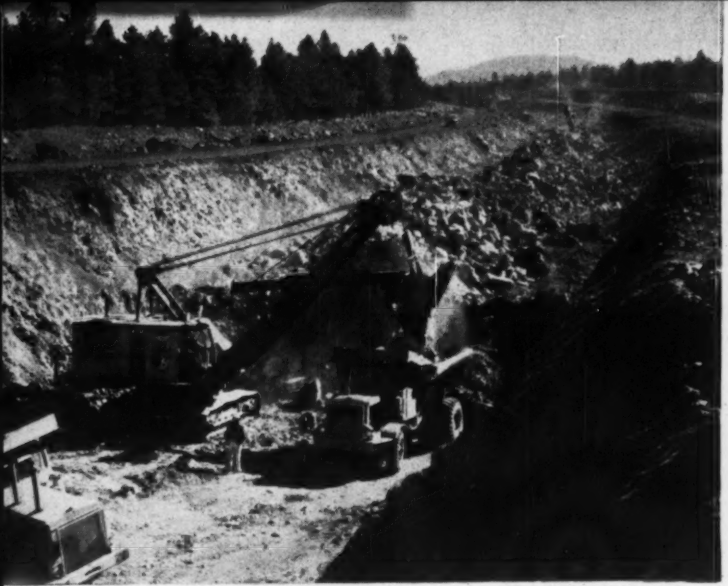
P-4

Just off the presses! New edition Primacord book is a catalog and condensed manual of proved blasting techniques using standard Primacord types in mining, stripping, quarrying, ditching and construction work. Write to the Company for free copy; give name, title and company address. Also available through your explosives manufacturer.

THE ENSIGN-BICKFORD COMPANY

Simsbury, Connecticut • Since 1836

CIRCLE 242 ON READER SERVICE CARD



Typical cut showing blasted rock, with 3-yd. shovels loading end-dumps. Note excellent fragmentation.

Courtesy Santa Fe Railway.

Typical blast in malpais, viewed from one end of the cut.

Typical blast viewed from side of cut. Length of shot is variable — 1,500 feet is common. Using Primacord, there is actually no limit to the number of holes that can be hooked up in one shot.

Courtesy Santa Fe Railway.

111-1
ON-KNUDSEN
INC.

Morrison-Knudsen Co., Inc., of Boise, Idaho, Contractor. Frank Sganga, Drilling and Blasting Superintendent (left), and Ernie Gilson, Blasting Foreman.

General view of a cut with blasting materials in foreground.

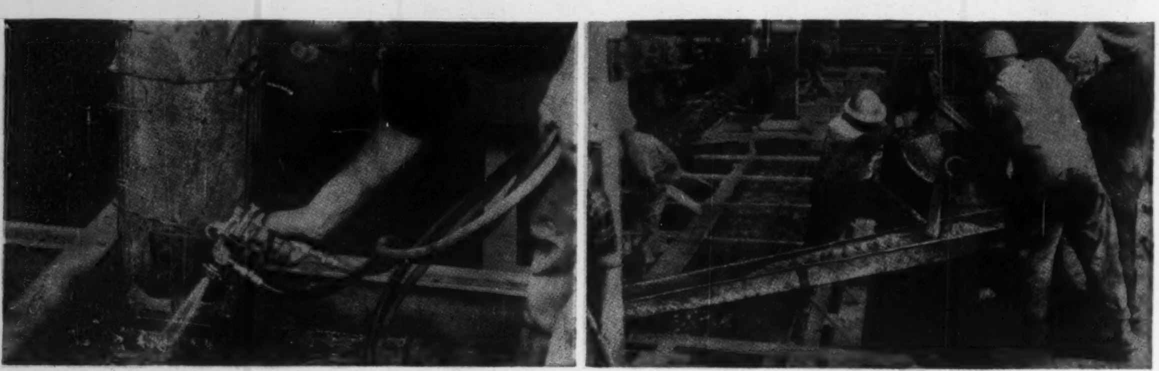
Priming a hole with Primacord.

Primacord trunklines are paid out from 1000-ft. spools.

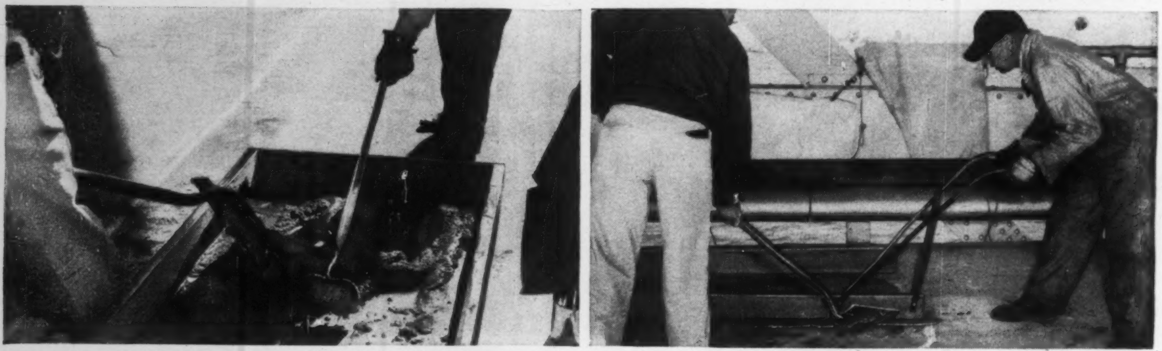
Primacord downlines are connected to trunklines which are crosstied at regular intervals. Primacord M/S Connectors are used in the trunkline system to insure the proper delay pattern.

Concrete adhesives and mortars with **THIOKOL** polysulfide polymer

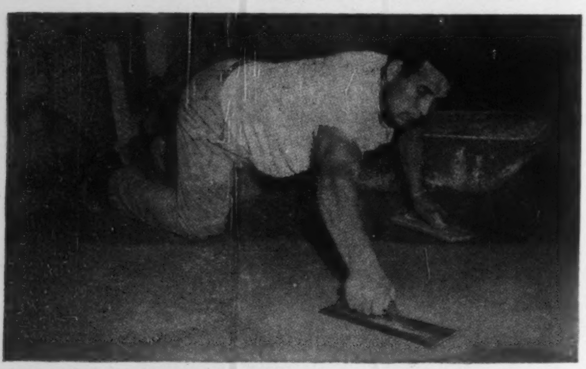
MAKE LITTLE OF BIG REPAIRS



STRUCTURAL. Polysulfide-modified concrete adhesives join new concrete to old—or rejoin old sound concrete—with a *watertight* bond that's stronger than concrete itself. They have wide use in vertical building. Their application on this fire-damaged marine terminal (gutted concrete sprayed with adhesive then new concrete poured) avoided complete reconstruction, saved the city years of time and millions of dollars in remedial costs.



ROADWAYS. Polysulfide-modified mortars patch potholes and fill ruts and dips. In this application, adhesive and aggregate are mixed in a ratio of 1 to 5, spread and troweled like concrete. Digging down to bedrock or exposing steel reinforcements and pouring new concrete (conventional repair techniques which tie up traffic for days) is avoided. Polysulfide-modified mortar cures fast. Time, labor and the public temper saved.



FLOOR PATCHING. In plants where regular concrete has broken down under exposure to abusive traffic, chemicals or corrosive agents, mortars with THIOKOL polysulfide polymer have stood the test of time and wear.

®Registered trademark of the Thiokol Chemical Corporation for its liquid polymers, rocket propellants, plasticizers and other chemical products.

Thiokol®
CHEMICAL CORPORATION
780 NORTH CLINTON AVENUE • TRENTON 7, NEW JERSEY
In Canada: Naugatuck Chemicals Division, Dominion Rubber Co., Elmira, Ontario

Thiokol Chemical Corporation is the raw material supplier of polysulfide polymer used in the manufacture of concrete adhesives and mortars.

FOR MORE INFORMATION: Mail Coupon to Dept. 2 CA-51
Thiokol Chemical Corp., 780 N. Clinton Ave., Trenton 7, N. J.

Send Thiokol's booklet "Concrete Adhesives for Concrete Construction & Maintenance." Also, a list of manufacturers marketing concrete adhesive systems.

Name______________________________

Firm______________________________

Street______________________________

City____________Zone______State________

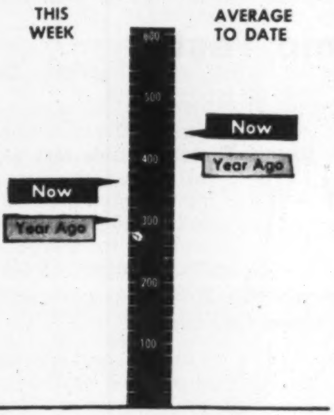
Chief interest: ☐ Structural ☐ Roadways ☐ Floor Patching

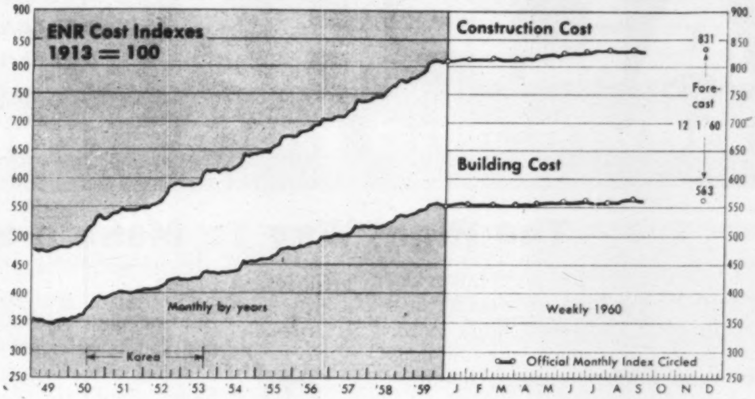
CIRCLE 244 ON READER SERVICE CARD

Construction Scoreboard

This Week . . .

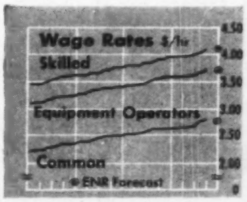
Contracts in Millions of Dollars

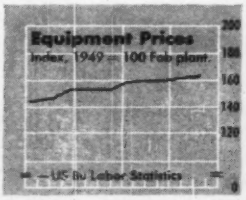


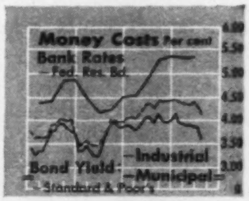


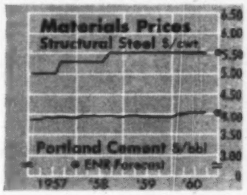
ENR INDEXES (1913=100), 20-cities' average	Week of Sept. 15 1960	% Change from Aug. 18 1960	% Change from Sept. 17 1959
Construction Cost	830.21	+0.03	+2.2
Building Cost	562.08	−0.01	+1.2

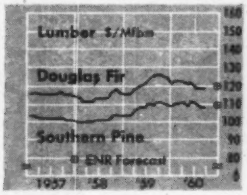
* To convert above indexes to 1926 = 100: Divide Construction Cost by 2.080; Building Cost by 1.850. 1949 = 100: Divide Construction Cost by 4.770; Building Cost by 3.518.

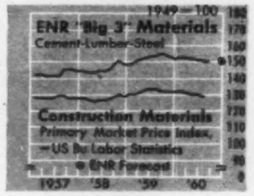












AMOUNT OF CONTRACTS LET

Contracts Awarded In 50 States By Type	This Week millions	Cum. 38 wks 1960 millions	Chge '59-'60 %
All Heavy Construction	$368.4	$17,048.7	+10
By Ownership			
PRIVATE	194.7	9,165.1	+18
PUBLIC	173.7	7,883.6	+2
State & Municipal	140.2	6,070.9	+10
Federal	33.5	1,812.7	−18
By Type of Work			
PUBLIC			
Waterworks	5.0	339.8	+10
Sewerage	8.6	429.0	−12
Bridges*	17.4	603.4	+36
Highways	55.6	2,475.4	+8
Earthwork, Dams & Waterways	10.4	597.6	−12
Buildings:			
Excl. Housing	46.0	1,804.2	−8
Housing	10.7	524.8	+5
Unclassified	20.1	1,112.4	+5
PRIVATE			
Buildings:			
Mass Housing	103.1	4,576.8	+32
Commercial	42.3	1,838.0	+9
Industrial	40.6	2,097.0	−4
Unclassified	8.6	650.3	+67

*Includes Private bridges

NOTE: Minimum size projects included are: Waterworks and waterways, $53,000; other public works, $88,000; industrial buildings, $110,000 other buildings, $400,000.

NEW CONSTRUCTION CAPITAL

	Week of Sept. 15 millions	Cum. 37 wks 1960 millions	Chge '59-'60 %
Corporate Securities	$ 50.8	$2,189.3	−17
State and Municipal:			
All Except Housing	105.9	4,773.5	+8
Housing	...	185.5	+147
Federal Loans	3.2	126.1	+27
Federal Aid	...	2,171.8	−13
Total Nonfederal	$159.9	$9,922.2	−3
Federal Appropriations:			
Projects in U.S.	$ ...	$2,556.1	+103
Outside U.S.	...	157.8	+3486
Total New Capital	$159.9	$12,706.1	+10

ENR COST INDEXES IN 22 CITIES, 1913=100

R: Aug. Index revised because of retroactive wage increase

City	Construction Cost Sept 1960	Construction Cost Percent Change from last Month	Construction Cost Percent Change from last Year	Building Cost Sept 1960	Building Cost Percent Change from last Month	Building Cost Percent Change from last Year
Atlanta	649.52	0	+4.1	500.82	+0.5	+0.8
Baltimore	754.72	+0.4	+1.3	560.56	+0.3	+1.3
Birmingham	674.37	+3.1	+3.4	525.80	+0.8	+2.6
Boston	833.21	+0.3	−0.3	566.78	+0.8	+0.1
Chicago	916.53	0	−0.7	591.59	0	+0.9
Cincinnati	843.70	0	+3.1	549.48	0	+1.8
Cleveland	943.40	0	+2.0	560.55	0	+0.5
Dallas	639.06	0	+5.8	523.78	+0.4	+6.8
Denver	756.22	−0.1	+1.0	551.18	−0.2	+0.8
Detroit	963.54	+0.01	+0.1	605.32	0	+1.1
Kansas City	818.02	0	+1.8	558.57	+0.4	+0.1
Los Angeles	908.20	0	+3.6	568.70	+0.9	+1.5
Minneapolis	890.16	0	+3.5	581.03	+0.8	+2.0
New Orleans	639.66	−0.3	+0.8	507.41	−0.5	0
New York	1,038.34	−0.2	+2.2	647.96	−0.4	−0.4
Philadelphia	830.37	0	+4.5	588.64	0R	+1.2
Pittsburgh	885.14	0	+3.2	621.28	+0.6	+1.9
St. Louis	895.46	−0.2	+1.7	579.04	−0.4	−0.1
San Francisco	882.81	−0.2	+2.9	560.02	+0.5	+1.6
Seattle	855.07	−0.3	+1.9	506.06	−0.4	−0.5
U. S.—20 Cities' avg	**830.92**	**+0.09**	**+2.3**	**562 59**	**+0.2**	**+1.2**
Montreal	650.39	0	+4.8	466.08	0	+2.1
Toronto	692.36	−0.7	+3.9	492.25	−1.0	−1.0

ALPHA **BETTER CONSTRUCTION THROUGH BETTER USE OF CEMENTS**

news and notes from the field

The Right Way To Make a Slump Test

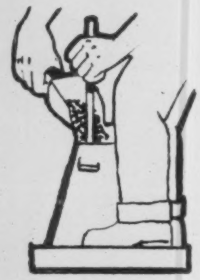
In many cases the acceptance or rejection of a load of concrete depends upon a one-inch variation in the slump. This much variation can be—and often is—caused by mistakes in making the slump test.

Sampling

If the slump test is to determine acceptability of the concrete, the sample must be taken from the early part of the load. Let out at least a wheelbarrowful before taking the sample. The first concrete out of the mixer should never be used for testing.

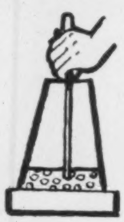
If the test is to be representative of the entire load, take samples from three parts of the load, directly from the mixer discharge. The total sample should be at least 80 lbs. and should be remixed in wheelbarrow before making slump.

1. Place Slump Cone on Plank, Slab or Steel Plate



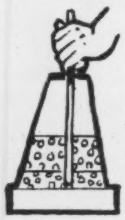
Moisten the inside of the cone and place it on a flat, level, firm surface which extends several inches beyond the base of the cone. When putting concrete in the cone stand on the foot lugs to hold it firmly in place.

2. Fill Cone in 3 Layers



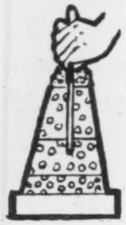
Fill the cone ⅓ full and rod layer exactly 25 times with a round, bullet-nosed iron or steel rod of ⅝″ diameter. Rod uniformly over the entire concrete layer.

3. Use Bullet-Nose ⅝″ Rod



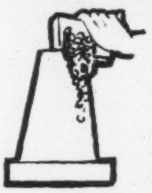
Fill the cone with the second layer until ⅔ full and rod this layer 25 times uniformly over the entire concrete surface, penetrating into but not through the first or bottom layer.

4. Rod Each Layer 25 Times Uniformly



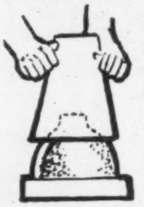
Fill the cone until it slightly overflows and then rod this top layer 25 times uniformly, penetrating into but not through the second layer.

5. Strike Off Excess Concrete



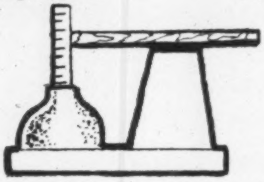
Strike off excess concrete from the top with a straightedge so that the cone is exactly full. Remove spilled concrete from around the bottom of the cone.

6. Remove Cone Carefully



Lift cone straight up, slowly and gently, immediately after filling, rodding and strike-off are completed. Never jar the concrete at this point.

7. Measure Slump From Bottom of Straightedge



Measure the slump as shown above. If the top of the slump is irregular, do not measure the high point or the low point. Try to get the average. Caution: Never reuse this concrete for cylinder strength tests.

Recommended Slumps for Various Types of Construction*

Type of Construction	Slump inches**	
	Maximum	Minimum
Reinforced foundation walls and footings, and thin plain walls	5	2
Plain footings, caissons, and substructure walls	4	1
Slabs, beams, and reinforced walls	6	3
Building columns	6	3
Pavements	3	2
Heavy mass construction	3	1

*Adapted from Table 4 of the 1940 Joint Committee "Report on Recommended Practice and Standard Specifications for Concrete and Reinforced Concrete."

**When high-frequency vibrators are used, the values given should be reduced about one-third.

Reprints of the information on this page are available for the asking.

ALPHA
PORTLAND CEMENT COMPANY
Alpha Building, Easton, Pa.

Aluminum Firm Pushes Redevelopment

- **Reynolds Metals' plunge into urban projects could accelerate city rebuilding.**
- **Other aluminum firms and producers of other materials may follow, bringing capital.**

Urban redevelopment under Title I of the National Housing Act is getting a big boost toward fast and tangible progress from a major producer of aluminum.

Reynolds Metals Co., through a subsidiary, is co-sponsoring redevelopment projects that ultimately will represent $300 million worth of construction and engineering.

Reynolds' move into urban renewal as a means of boosting use of aluminum as a structural material is encouraging—perhaps even forcing—competitors into major construction ventures.

Aluminum Company of America is 40% owner of a Webb & Knapp Inc. subsidiary, which will develop the $250-million Century City in Los Angeles (ENR Sept. 1, p. 26). This project is 100% privately backed—no funds will come from government.

Reynolds' renewal subsidiary, Reynolds Aluminum Service Corp. (RASCO), is negotiating to bring other materials producers into urban redevelopment projects in a big way. If successful, this could mean that producers of steel, cement, structural clay products and copper—along with manufacturers of thousands of components and building products made from the primary material—would be adding their financial resources to the redevelopment effort.

Meanwhile, RASCO is up to its corporate neck in a handful or redevelopment projects and going after more.

It is bidding on local urban renewal projects, usually through a real estate development company acting as agent, either on a negotiated contract or competive bid basis. The ground rules established by the local authorities are followed in either case. When RASCO obtains a development contract, it establishes a separate local company to manage the project.

Reynolds' management sees the new promotion program as much an "educational" campaign as a direct company sales venture. Albert M. Cole, former Housing and Home Finance Administrator, now executive vice-president of RASCO says:

"We are not going into the construction or mortgage banking business; rather we will serve as coordinator of projects."

Reynolds aims, first, at winning the cooperation of local builders, engineers, architects and developers by helping them get new business, and, second, proving to the construction industry that aluminum is a practical, competitive building material with a wide range of new uses in low-cost housing and apartment developments.

So RASCO takes a local builder or developer into partnership in the local development company. His share depends on him. Mr. Cole says it ranges from "nominal to 49%."

This partnership puts up the "front money"—initial costs of the land, hiring of engineers and architects. The corporation then goes to private banks and other lenders to borrow the construction funds, the money it will actually need to build the project. It then places the long-term mortgage either through Federal National mortgage Assn. (Fannie Mae), or banks or mortgage companies.

Last week RASCO started a $4-million row-house and apartment development in Cincinati. Jewel Builders Inc. of Columbus is RASCO's partner. This project will be a cooperative one; each living unit will be sold.

Mr. Cole hopes the cooperative method—more familiar in high-cost luxury apartment houses—will catch on not only in low-cost apartment projects, but also in developments of individual houses.

The Cincinnati project consists of 323 residential units, including houses and apartment units.

Aluminum materials will include: grid extrusions; rib siding; shingles and accessories; windows; ductwork; gutters, downspouts and accessories; porch sub-flooring; soffit and accessories; sheet for gables and trim.

It also may be used in: exterior stair flights and platforms, interior stair rails, porch channels and exterior stair rails.

RASCO says 302,376 pounds of aluminum may be used. Reynolds expects to sell 235,000 pounds of that total.

This raises the big question facing RASCO: Can aluminum actually compete in either builders' or retail price ranges with other materials? Mr. Cole is cautiously optimistic. In Cincinnati, he flatly states that RASCO proved the material was competitive in every item used.

However, Mr. Cole concedes, aluminum has yet to prove its competitiveness in all building material categories. "This problem," says Mr. Cole, "is Reynolds' and other primary producers'. It is up to the industry to show it can compete, and make the necessary laboratory and manufacturing economies that will show up in the final price. The breakthrough is imminent, if not already at hand."

He points out that the competitiveness of aluminum depends on the particular item concerned. But he adds that the durability and low-maintenance cost of aluminum gives the metal an extra advantage over lower-price materials.

Mr. Cole says RASCO is not in business to sell at manufacturers costs as a promotion stunt—"we are selling every item at normal market profit."

RASCO has other projects in the works. The biggest is a $250-million job in Philadelphia's Eastwick Section (ENR June 9, p. 21). This will include 10,000 to 12,000 residential units, mainly row houses, plus commercial and industrial buildings and service shops.

In Washington, D. C., RASCO will develop a $9-million, 533-unit, cooperative apartment house and town house project in Southwest River Park.

A $6-million cooperative, made up of 600 "Reynolds economy town houses and garden apartments" is scheduled for Kansas City, Mo.

Across the river in Kansas City, Kan., a cooperative of 300 row houses, and garden apartments costing $4-million is planned.

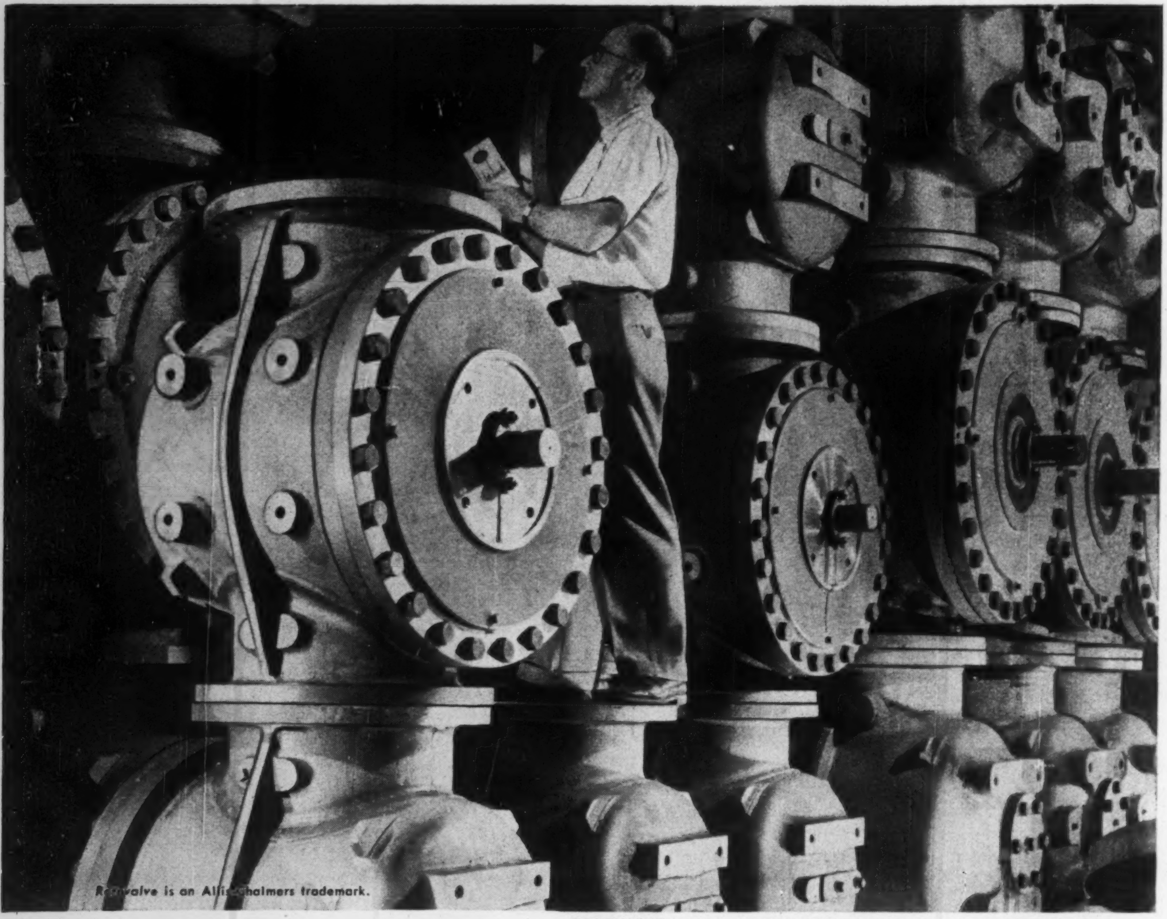
In addition to these scheduled projects, RASCO has two other project contracts: A rehabilitation project in Baltimore, which calls for the renovation—with aluminum—of the city's old white-stone-stepped row-houses; and a study of the Louisville riverfront to determine the feasibility of erecting a high-rise apartment development.

Other projects are being negotiated.

ALLIS-CHALMERS

A-C ALLIS-CHALMERS

A-1260



Rotovalve is an Allis-Chalmers trademark.

ROTOVALVE stocks at A-C York Works save months of delay for customers.

Another Allis-Chalmers time-saving exclusive:

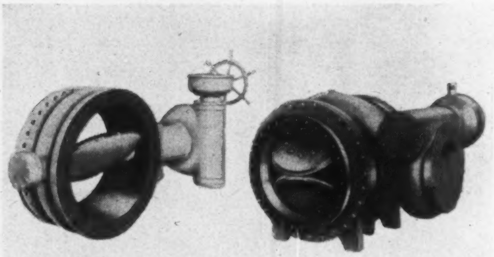
Cone valves "right off the shelf!"

Six to thirty-inch *Rotovalve* units — awaiting your call. Think of the valuable time you save! Typical is the case of a western municipality that recently needed one 24-inch and three 20-inch *Rotovalve* units for their waterworks. Allis-Chalmers assembled all accessories required, completed testing and shipped the valves to customer in less than three weeks! Compare this with the 3 to 6 months normally required by other suppliers for delivery.

Perpetual off-the-shelf inventory of *Rotovalve* units, butterfly and ball valves gives Allis-Chalmers today's only complete rotary valve-stocking program . . . guarantees fastest deliveries to you.

Avoid troublesome, costly delays and get the valves you need to do the job right. For immediate assistance anytime, call your nearby A-C valve representative, district office or write **Allis-Chalmers,** Hydraulic Division, York, Pa.

Rotovalve is an Allis-Chalmers trademark.



Standard butterfly and ball valves illustrated are also available from stock in a broad range of sizes.

States Need More Roadbuilding Money

Requests for highway and public works money flow in as 46 states schedule 1961 legislative sessions

State agencies responsible for construction and maintenance of highways and streets are already starting to ask for increased funds to meet present and projected road needs. And for good reason; 46 states have regularly scheduled legislative sessions next year. For 30 of these, it will be the last regular session until 1963.

Unless highway and public works officials get the needed construction funds next year, chances are good that those in most of the 30 states having only a biennial session would be strapped for money for another two years.

It is fairly certain that proposals to place additional taxes on gasoline will be met by stiff opposition from petroleum interests and highway users. They have opposed gas taxes in the past, but without much luck.

Next year could be different. The onward and upward march of fuel levies may be running out of gas. Lawmakers may hear—and listen to—the motor vehicle owners' protests.

A new organization, called the Gasoline Tax Education Committee, is trying to stir grassroots opposition through heavy newspaper and radio advertising. The campaign is aimed at blocking both new increases and diversion of gas taxes to nonhighway uses. The latter effort may prove successful to the extent that state lawmakers may see it as a means of compromise—boost the gas tax, but earmark the increase for highway purposes only.

But despite the mounting opposition, highway and public works administrators are presenting their case to lawmakers.

California's Department of Public Works told the state legislature's transportation committee that it will cost $12.7 billion in the next 20 years to provide improvements for county roads and city streets. The department estimates there is a need "right now" for nearly $2 billion worth of improvements in local streets, just to meet present traffic conditions. The total will top $12 billion by 1980.

A one-cent-per-gallon increase in the state gasoline tax was suggested as one means of helping meet the anticipated expenditures. An alternative suggestion called for an increase in motor vehicle license fees amounting to $1 per $100 of valuation.

The Pennsylvania Highway Department has warned a legislative group that its highway construction program will be cut next year unless additional funds are provided. It too suggests a boost in the gasoline tax, the motor vehicle license fees or both (ENR Sept. 8, p. 77).

Oklahoma's State Highway Commission is asking that the amount of money it receives from the state general fund be increased from $17.3 million received this year to $27.4 million next year. This total would be in addition to approximately $33 million received each year from earmarked state gasoline taxes.

North Carolina, which recently outlined a 15-year highway construction program to cost $505 million (ENR Sept. 8, p. 77), formally presented its suggestions for raising the money to the State Advisory Budget Commission. The Highway Commission asked that the automobile license fees be boosted from their present sliding scale of $10, $12 and $14, to $14, $17 and $20 a year; that the gasoline tax, now six cents a gallon, be raised one-quarter of a cent per gallon; and that highway-user levies now diverted to non-highway purposes be turned over to the highway fund. These moves would fill the gap between revenues that would be obtained under the present set-up and the amount that will be needed to complete the long-range program. The deficit over the 15 years is estimated at $505 million.

Contractor Sues for $12.5 Million

The fight between Hal B. Hayes, Los Angeles contractor, and the Federal Housing Administration over Capehart military housing is now in a Los Angeles Superior Court.

Mr. Hayes is suing the FHA and a basketful of banks and bonding companies for $12.5 million, charging he is the victim of a "plot." He was declared in default on construction of 3,448 housing units at five military bases (ENR Aug. 18, p. 141).

The papers filed claim that the defendants are making him the "scapegoat" in an effort to cover up an FHA scandal in an election year.

Mr. Hayes cites a report by the U. S. Comptroller General that says FHA has approved construction of 5,900 more housing units than are needed by the Defense Department at a cost of $147 million. Laxity in the administration and supervision of the jobs is also charged in the Comptroller General's report.

Mr. Hayes says FHA declared him in default to cover up the excess housing.

The contractor had attempted to dispose of some of his interests in the contracts he holds for the housing. He says the contracts are worth $56 million to $63 million and that he should be permitted to sublease a small percentage of the units. FHA and the Defense Department say they are the owners; that Mr. Hayes, therefore, has no right to sell or lease any part of his "interests."

In Washington, D. C., FHA officials say papers have not yet been served on them.

Both FHA and the Defense Department are pressing Mr. Hayes' lenders and bonding company to get construction of the housing started again. Under Mr. Hayes' agreements with the lenders, they can take over his rights and obligations if he is in default.

The Pentagon hopes that some of the half-dozen banks, working with the bonding company, will select substitute contractors to finish construction.

Or some lenders may decide to avoid litigation by assigning the FHA-insured mortgages on the housing to that agency. They would then receive interest-bearing debentures from the FHA.

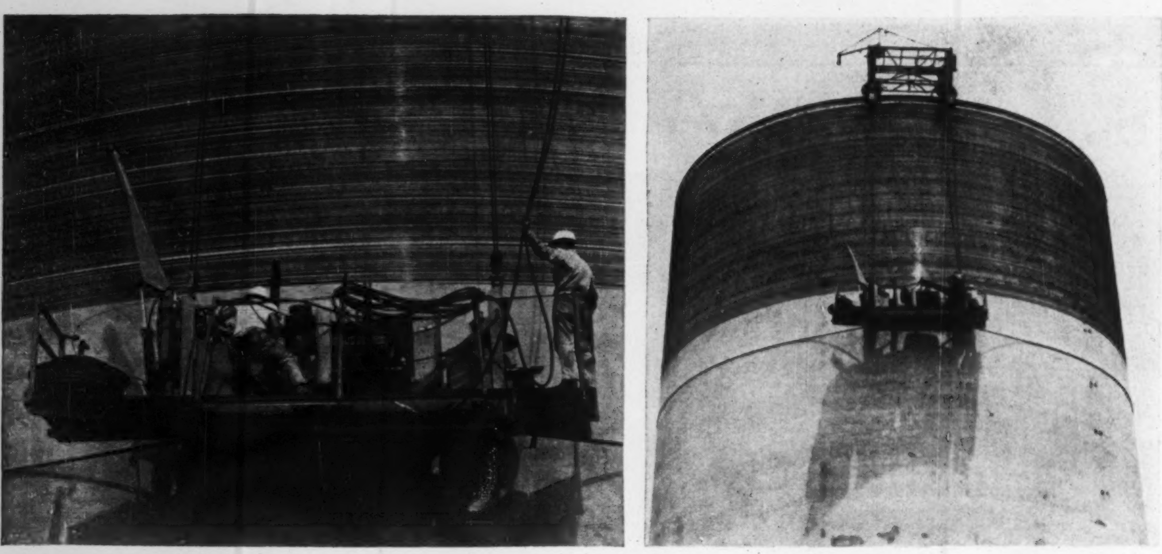
Engineers Buy Back Firm In Canada from Fluor

Twenty-one senior members of H. G. Acres & Co., Ltd. of Niagara Falls, Ontario, last week bought back control of the company from Fluor Corp. of Canada Ltd., wholly owned subsidiary of Fluor Corp. of Los Angeles.

Seven years ago, Fluor bought 60% interest in the Acres Co., one of Canada's largest consulting engineering firms, but did not change management. The purchase gave Fluor a Canadian petrochemical engineering organization, while providing Acres with funds to meet impending retirements.

Terms of the latest transaction were not disclosed.

Acres employs 265 engineers and technicians at Niagara Falls, and 30 engineers in the field. The company's largest foreign commitment now is completion of the Warsak Dam in Pakistan, a $50-million project.



WIRE-WINDER OPERATING on the 2.95 million gallon prestressed concrete water storage standpipe for Sayreville, N. J., recently completed by Preload.

CONSTRUCTION DAILY—provides the invaluable advantage of long-term advance notice — *says The Preload Company*

With world-wide application of its circular prestressing methods, The Preload Company says, "Construction Daily is used by the Vice President, Sales, who forwards advance notices on water & sewage works to District Sales Managers throughout the country. Water storage bond issues, bid dates, names of consulting engineers, are the items looked for by Sales. Construction Daily is also routed to Vice President, Operations, who reviews prices and the cost index. Essentially, Construction Daily provides the invaluable advantage of long-term *advance* notice on water storage projects to allow our sales forces to get in on a project early and to plan well coordinated positive action to insure the best chance of realizing a contract. Of all the news information services available today, we have found Construction Daily best provides this key requirement."

Construction Daily is exactly what it says, a daily report of construction activity. It comes to you in two sections — the daily newsletter and daily construction reports. Newly announced bid dates, proposed new projects, price information, hot news from Washington and elsewhere are all subjects of the newsletter.

The reports section includes bids asked, low bids and contract awards that top $80,000,000 worth of business a day! It's the fastest, most complete system of reports on building and construction that yields the most business per project in the nation.

Facts you need on every kind of construction arrive daily. They are rushed to you by a large editorial-and-research staff backed by 143 reporters located strategically in all important construction centers around the world. In every case, you get a head start on local, regional, national, and even international projects.

A full year's subscription to this daily specialized news service costs only $225. A three-months' trial subscription is available for $65. Write now for complete details.

About Preload...

The Preload Company started building prestressed concrete tanks in 1934 and has built over 2,500 storage structures for uses which include water and fuel reservoirs, elevated water storage reservoirs, sewage digesters and clarifiers, chemical storage vats and nuclear reactor vessels. Preload's circular prestressing methods have also been used in the construction of auditorium and sports stadium roofs; the company is presently working on a job prestressing 12 underground control houses at a U. S. Air Force missile facility.

The company's operations are world wide.

Design and construction headquarters for The Preload Company are at 355 Lexington Avenue, New York 17, N. Y.

Construction Daily

A McGRAW-HILL PUBLICATION

Dept. ENR 109 **330 West 42nd Street, New York 36, N. Y.**

CIRCLE 250 ON READER SERVICE CARD

Agreement Makes Jobs All-Union

- **Michigan unions and contractors sign pact cut to fit Landrum-Griffin hot-cargo exemption.**
- **It requires that all contractual relationships entered into for on-site work be wholly union.**

Construction management and union officials in Grand Rapids, Mich., are pleased by a new labor agreement that requires contractors to decline work on jobs that are not all-union or that have contractors or sub-contractors or on-site suppliers who do not have labor contracts with the signatory unions.

The agreement between the Grand Rapids Contractors Association and the Grand Rapids Building Trades Council, AFL-CIO, was executed under the construction industry's controversial hot-cargo exemption in the Landrum-Griffin labor law.

Wesley Jeltema, president of the contractors association, said the agreement would bring "much finer relationship between the contractors and unions and may tend to straighten out many troublesome situations, notably bid peddling."

Mr. Jeltema conceded that a few subcontractors "may be unhappy with it" but he said contractors "by and large are well satisfied with it." The agreement has been in the making for five or six years, he noted, and the Landrum-Griffin law enabled it to become a reality.

Although the law bans both the execution and enforcement of hot-cargo clauses, it allows the construction industry to place restrictions on the contracting and subcontracting of on-site work.

The agreement, which applies to construction work in six counties and parts of a seventh, provides, in part: "Each employer signatory hereto agrees with each of the signatory labor unions with which it has a collective labor contract that it will cease and refrain from any contractual relationship relating to the performance of work at the sites of construction, alteration, painting or repair of a building, structure or other work unless all work done and to be performed in connection therewith at such site shall be performed by one or more employers each of whom has executed a collective labor contract with a signatory labor organization for the class of work to be performed at that site."

The unions and their members, in turn, agree not to work except under these conditions. In case of violations, the aggrieved party can seek appropriate court relief, including an injunction. The unions promise to take disciplinary action against offending members.

The agreement is specifically limited to "contracting and subcontracting of work to be done at the site" and relates only to "contractual relationships."

Residential construction is excepted, because it is not strongly unionized. And highway, bridge and airport runway construction are also excepted, because the contractors are primarily engaged in industrial and institutional work and because most of such work is covered by statewide agreements.

Robert Coulter, secretary of the Michigan State Building and Construction Trades Council said that labor naturally feels "good about this agreement. This is part of a general attempt of labor and management of the Grand Rapids area to solve mutual problems by cooperation. I think it will be the forerunner of a statewide program that may spread to all 23 building trades councils in Michigan."

"Management and labor both feel this is the only way to protect wages and hours agreements in the industry," observed Robert Kliner, attorney for David Almerigi, council president.

The agreement represents one way of implementing the union rule against working with nonunion men. It cannot be done by picketing under the Denver Building Trades case—which is what the situs picketing bill seeks to reverse. Still unanswered, however, is the right to strike to enforce the subcontractor clause.

Commenting on this aspect of the Grand Rapids agreement, Mr. Jeltema said: "All employers and employees covered must cease and refrain from all work at a site if a nonunion group is employed. While this agreement might not necessarily apply on work done in shops with nonunion labor, as soon as a subcontractor intended to work on a site installing his product, he would have to be unionized or work would stop."

Management and union leaders agree that the pact applies to suppliers who perform their own work at the site under subcontracts. And they feel that unions must refuse to work if contractors are in violation of the agreement.

The law permits construction industry employers to agree not to do business with or handle the products of another person working at the site.

House managers of the Landrum-Griffin bill were silent about the right of unions to refuse to work to enforce such clauses. They merely said that picketing to enforce them is illegal and that the Denver Building Trades rule still applies.

Sponsors of the Grand Rapids agreement have carefully considered the legal implications and feel the contract conforms to the law.

Nationwide Strike Hits Dominion Jobs in Canada

A union demand for a standard national labor agreement has led to a nationwide strike against Dominion Bridge Co., Ltd. of Toronto, Canada.

The strike threatened last week to cripple or shutdown some of the biggest office building construction projects in the country.

It began last month at Dominion's Montreal and Toronto plants and was later extended by the United Steelworkers of America to all the firm's 11 plants.

Three of the big projects affected are the Place Ville Marie cruciform building, the C-I-L building and the Canadian Bank of Commerce building, all in Montreal. Dominion is supplying the structural steel in each instance.

The union has asked for a standard agreement with varying wage rates for the different plants. Dominion has insisted that bargaining for the various plants be done on a local basis. A national agreement, it said, is impossible because conditions vary in each of the provinces.

Negotiations have been broken off. No settlement was in sight last week.

Some steel for two of the Montreal jobs was obtained from Dominion warehouses under court order last week.

Maintenance Becomes a Problem

Hundreds of broken window panes in the Des Moines, Iowa, public schools were silent witnesses last week to a labor dispute that has given maintenance by contract a rather unsatisfactory test.

Thirty-five union workers employed by the city school board on school repairs, renovations and alterations walked off their jobs last month in a wage dispute. Since then, the board has been handling the necessary work by letting contracts.

Unlike the typical situation of national interest, the striking maintenance workers are union building tradesmen who are having their cake and eating it, too. And local contractors appear to be making little effort to capitalize on the school board's problem.

The walkout occurred after the board turned down a request for a wage increase. Ordinarily, the workers are paid prevailing craft rates as a matter of practice, not of law. Recent wage boosts in the industry put them in line for raises of 12.5 to 18 cents an hour.

The school board was unable to raise teacher salaries this year and felt it would not be fair to do an about face and give the maintenance workers a raise. It has offered a week's paid vacation and sick leave benefits but would keep the wage rates at the 1959-60 levels.

Those who struck in protest are represented by nine unions—all in the building trades, with carpenters and painters the most heavily represented. Balance of the 45- to 50-member maintenance staff are nonunion, salaried workers who have worked harmoniously with the union men.

The contract system, to which the board has turned temporarily, has not been satisfactory for several reasons:

- One of them, according to Arthur Templeton, assistant to the superintendent in charge of construction, operation and maintenance, is "We are not equipped to write specifications for handling all this work by contract" or to supervise it. Mr. Templeton said he would ordinarily send an electrician or painter out to do a job and he would know where to go and what to do. Now, Mr. Templeton has to "call around to several firms" to find someone to do the job, and then "the contractor's man has to have detailed directions, or an escort."
- Most of the contractors are busy, and some will not even bid. Those who get the jobs are often "understandably" slow. Two firms, for example, were given contracts on August 4 to replace broken glass in 16 schools and only five jobs were finished by last week.
- Some believe the contract system is more costly. The school district spends more than $400,000 a year for maintenance labor and materials. A union spokesman said the labor cost is about $233,000, on the force account basis but would run about $323,000 on a labor-materials contract basis, because of the markup on labor. Markups on materials, he said, would increase the difference. One board member said the school district had paid its glazers $3.15 an hour and is now paying $5.50 an hour for the same work through a contractor.

All the contracts so far have gone to union contractors whose workers belong to the same unions the strikers do. Some of the strikers are now back on school jobs at higher pay as employees of the contractors.

The union people see little likelihood of settlement on any terms but payment of prevailing wages. They say most of the union work force finds steady employment in contract construction and that the steady work offered on the school force cuts little ice. Fewer than 10% of the union construction workers were out of work at the slowest period last winter, it is reported.

In contrast to the Des Moines situation, construction industry labor and management at the national level are actively promoting the principle of maintenance by contract through the Construction Industry Joint Conference. But a Des Moines labor spokesman said in this case, "We have no choice."

Out of the dispute, however, has developed some feeling that maintenance workers have been doing work that they should not do. Salaried workers have handled such jobs, for example, as a complete re-roofing and the tearing out and replacing of all the toilet facilities in a school.

School board President L. L. Daubert said some clarification of policy on this issue may be forthcoming before a settlement is reached with the union maintenance workers.

Hawaii Gets Master Labor Pact

The first master labor agreement ever negotiated in the construction industry in Hawaii has been signed by four of the AFL-CIO building trades unions and key members of the General Contractors Association of Hawaii.

The three-year contract covers 4,000 workers now, but additional signings could boost coverage to 10,000.

Under negotiation for two years and under intensive study since last May, the pact gives contractors a promise of labor stability and gives the AFL-CIO building trades important membership gains and a chance to dominate the field in Hawaii.

Terms of the agreement include a 60-cent, across-the-board wage increase to be paid in 10-cent installments every six months; a no-strike, no-lockout clause that provides for union-employer committees to investigate picket lines of other unions that threaten work stoppages; an eight-day union shop clause; a medical plan, the full cost of which employers will assume after July 1, 1961; dues check-off; overtime after eight hours a day or 40 hours a week; eight holidays a year and premium pay for night shifts.

The four signatory unions are carpenters, operating engineers, laborers, and plasterers and cement masons.

The General Contractors Association has won roughly similar pacts with all the major subtrades except painters. Subtrades under contract include plumbers, electricians, roofers, iron workers, sheet metal workers, plasterers and lathers.

The AFL-CIO Building Trades Council hopes to expand the master contract of the basic trades to cover another 4,000 basic trades workers by signing agreements shortly with the Home Builders Association, which is the other major construction group in Hawaii.

Members of GCA employ about 7,500 of the islands' 14,500 construction workers. Home Builders hire another 4,000. The balance work for outlying island contractors, who are not members of either association, and for the government at military bases.

There is some possibility that the new-found labor peace may be disrupted by organizing efforts of the teamsters and longshoremen, who have signed a mutual assistance pact in Hawaii. Carpenters and cement masons now get $3.20 under the new agreement.

Bids for Engineers

AFL-CIO union sets up an Engineering Council

The AFL-CIO moved deeper into the field of engineering unionism last week, when the International Union of Electrical Workers unanimously voted to establish an Engineering Council at the international union level.

The resolution of authorization was adopted at the union's biennial convention held at Miami Beach, Fla.

Union President James Carey, commenting on the significance of the action, said: "An Engineering Council of the international union will make IUE more attractive to engineers who, in our industry and other industries, are coming to the conclusion that the most auspicious course for their professional advancement is through solidarity with the labor movement."

The resolution urges the union's local divisions that have unions representing engineers and technicians, to form local engineering councils. And it commits the IUE to work toward formation of an Engineering Council within the AFL-CIO's Industrial Union Department.

The IUE finds the "importance of the engineer" as part of the work force increasing rapidly. It has proved that "professional engineers can be organized," it says, without becoming "less professional." The union claims to be the "leading group" in engineering unionism.

Under the IUE plan, the national council will be composed of representatives elected by the engineers themselves from the local engineering councils. It will give engineers in the union representation on the union's Executive Board.

It was the promise of such action that helped induce the Sperry Gyroscope engineering union, which is known as Engineers Association, to affiliate with the IUE last summer.

Adverse reaction to the affiliation is believed to have contributed to a recent decertification vote against EA (ENR Sept. 15, p. 101). EA began the formal National Labor Relations Board proceedings to contest the election last week and remains the legal bargaining agent until the board disposes of the challenge.

Meanwhile, Paul H.Robbins, executive director of the National Association of Professional Engineers, has called the vote a "welcome confirmation of the trend among engineers to look toward professional means to serve their interests."

OFFICIAL PROPOSALS

Bids: November 22, 1960

Philadelphia, Penna. Procurement Department Water Department

Sealed bids will be received in Room 313, City Hall Annex, until 2.30 P.M. (E.S.T.) on Tuesday, November 22, 1960, and opened at that time, for Bid No. 2632—Work No. S-2775-R.

Reconstruction of Mill Creek Sewer in its Present Location in Forty Sixth Street from 33′ + N. of Market Street to Haverford Avenue and in Right of Way N.W. of Forty Sixth Street and Haverford Avenue from Haverford Avenue to 120′ + N.W.

PRINCIPAL ITEMS OF WORK

Excavation	34,100 cu. yds.
17′0″ high X 18′0″ wide, circular arch, reinforced concrete sewer with stone block invert	1,617 lin. ft.
Brick Manholes	3
Wellholes	2
Concrete Paving Base	1,600 cu. yds.
Asphalt Paving	7,000 cu. yds.

Proposal forms, questionnaires and specifications may be obtained from the Water Department, in Room 1132, City Hall Annex, Juniper Street and Filbert Street, Philadelphia 7, Penna. Blueprints of plans may be purchased at bidder's expense, directly from the Keystone Blue Paper Company, 1230 Arch Street, Philadelphia 3, Penna.

No bids will be received unless bidder is qualified by the Procurement Commissioner. The questionnaire form with all questions fully answered must be filed with the Water Commissioner, 1113 City Hall Annex, at least one (1) week prior to the date of opening of bids.

Each proposal must be accompanied by security in form and amount as set forth in the proposal form.

Michael H. Sura, Commissioner.

Bids: October 26, 1960

Notice to Bidders City of Richmond, Virginia

Sealed proposals will be received at the office of the Director of General Services, 2907 North Boulevard, Richmond, Virginia, until but not later than 11 o'clock A.M. E.S.T., October 26, 1960, at which time they will be publicly opened and read aloud, for the following work which may be awarded in whole or in part:

Type of Work: The work to be done is part of the Sewage Disposal Project, is entitled "Division C—Hull Street Intercepting Sewer", and comprises the construction of approximately 4,114 linear feet of 60-inch and approximately 898 linear feet of 54-inch reinforced concrete culvert pipe sewer, complete with all manholes, junction and intercepting chambers, siphon, bridge and railroad crossings, portal openings, and all other structures, as shown, specified and directed.

Location: The intercepting sewer is to be constructed adjacent to Brander Street from the entrance roadway to the Sewage Treatment Plant, northwesterly to Maury Street; in Brander Street from Maury Street to Preble Street; thence, northeasterly to the south bank of the James River; thence northwesterly along the south bank of the James River to a location near the Southern Railway System's bridge northwest of the Mayo Bridge. The connecting sewer is to be constructed in Brander Street and on private right-of-way from Preble Street to the outfall of the Stockton Street Combined Sewer. All of this sewer construction work is located in the City of Richmond, Virginia.

The Proposal, Instructions to Bidders, Contract, Performance Bond, Instructions to the Contractor, Specifications, Plans and other Contract Documents may be examined at the office of the Director of Public Works, 217 Governor Street, Richmond, Virginia and at the office of Greeley and Hansen, Engineers, 14 East Jackson Boulevard, Chicago 4, Illinois. Copies of the Contract Documents may be obtained from the office of the Director of Public Works, upon the deposit of Twenty-five Dollars for each set. Any party who submits a bona fide bid on the project will be refunded his payment in full for not more than three sets, and will be refunded Fifteen Dollars per set for each additional set. All others will be refunded Fifteen Dollars per set upon the return of the documents in good condition within ten days after the opening of bids.

It shall be understood that all documents referred to in this Notice to Bidders shall be carefully examined and read and are all hereby made a part of the Proposal.

J. W. HUFFMAN
Director of General Services

Bids: November 15, 1960

The Pennsylvania Railroad Company

Contract No. 3—Demolition and Removal of Pier 2 and Fenders of Delair Bridge No. 2.07 over Delaware River, Philadelphia, Pa.
Notice to Contractors:

Sealed proposals for the demolition and removal of Pier 2 and Fenders of the railroad bridge between Philadelphia, Pa. and Delair, N. J., will be received at the office of the Assistant Chief Engineer-Construction, Room 1640, Transportation Center, Number Six Penn Center Plaza, Philadelphia 4, Pa., until 2:00 P.M. on November 15, 1960 at which time said proposals will be opened and publicly read.

Contract documents may be seen at the above mentioned office on and after September 21st, 1960. Documents will be furnished upon deposit of $10.00 per set for not more than three sets to any one company. Deposit is returnable only to bidders who return the documents in good order within one week after the opening of proposals.

THE PENNSYLVANIA RAILROAD COMPANY
J. F. Piper
Assistant Chief Engineer-Construction

Bids: October 3, 1960

Board of Education—Bureau of Construction

Notice Re: Prequalification Forms for Contractors

APPROVED AS TO FORM
Acting Corp. Counsel

NOTICE IS HEREBY GIVEN THAT the Deputy Superintendent of Schools, Office of School Buildings, Bureau of Construction, 4th Floor, Room 407, 42-15 Crescent Street, Long Island City 1, New York will receive applications for prequalification from contractors who may wish to submit bids for the proposed hereinafter specified contracts.

For the General Construction, Plumbing and Drainage, Heating and Ventilating, Electrical Work and Lighting Fixtures of:

Public School 154, Alexander Avenue, between East 136th Street, and Major Deegan Boulevard, Borough of the Bronx.

The prequalification application form must be secured at the Office of School Buildings, Bureau of Construction, Room 407, 42-15 Crescent Street, Long Island City 1, N. Y., and submitted to the Deputy Superintendent of Schools, at the same above address.

Bids, when advertised, will be received only from prequalified bidders.

The time for submitting prequalification applications by contractors will expire on Monday, October 3, 1960.

JOSEPH R. WEISS
Deputy Superintendent of Schools

Starting: Wednesday, September 14, 1960
Five (5) days.
Dated: September 12, 1960
JJF:dem

Read the Official Proposal Columns of
ENGINEERING NEWS-RECORD
This Week and Every Week

OFFICIAL PROPOSALS

RATE: **The rate for Official Proposal advertising is $2.40 per line or fraction set solid. Where the advertisement is set other than solid, the space is measured by total space occupied and charged on basis of 12 lines to the inch.**

CLOSING DATE: **Friday 10:30 A.M. for issue dated the following Thursday.**

SEND COPY TO: **Official Proposal Division,**
Engineering News-Record
Class. Adv. Div.,
P. O. Box 12, N. Y. 36, N. Y.

Bids: October 20, 1960

Sewage Work Improvements
Division A, B, C, J, K and M

CITY OF MARION, INDIANA
ADVERTISEMENT FOR BIDS

The City of Marion, Indiana, will receive sealed Proposals for the construction of Sewage Treatment Plant Additions, Interceptors and Relief Sewers, and the Lomax Avenue Pumping Station and Sanitary Relief Sewer until 10:00 A.M., Central Standard Time, on the 20th day of October 1960, at the office of the City Clerk, Marion, Indiana.

All Proposals received will be publicly opened and read aloud in the City Council Chambers at Marion, Indiana, beginning at 10:00 A.M., Central Standard Time, on the 20th day of October, 1960.

The Contract Documents including plans and specifications are on file and available for inspection at the office of the City Engineer, City Hall, Marion, Indiana, and at the office of Consoer, Townsend & Associates, Consulting Engineers, 360 East Grand Avenue, Chicago 11, Illinois.

Copies of documents including plans and specifications required for review or bidding purposes may be obtained only from the City Clerk by depositing $90.00 for proposed Division A; $15.00 for proposed Division B; $20.00 for proposed Division C; $15.00 for proposed Division J; $25.00 for proposed Division K, and $20.00 for proposed Division M at the office of the City Clerk for each set of documents so obtained.

Since the Documents for Divisions B, C, J and K, excluding the plans, comprise forms, information, and specifications applicable to all four (4) Divisions, a single document will be issued upon requests for plans for one or more than one Division.

The full amount of the deposit for one set of documents and one-half of the deposit for any additional sets of documents will be refunded to each bidder who submits a formal Proposal to the City of Marion and who also returns the plans (and specifications on additional sets) in good condition to the City Clerk within ten (10) days after his bid security has been returned to him.

Equipment manufacturers, subcontractors and others who do not submit formal proposals to the City of Marion will be refunded one-half the amount of the deposit for all sets of complete documents including plans and specifications returned in good condition to the City Clerk within ten (10) days after the opening of bids. No refund will be made for documents received by the City Clerk after this ten (10) day period.

A certified check drawn on a solvent bank in the State of Indiana, payable without condition to the City of Marion, Indiana, in an amount of not less than five per cent (5%) of the bid shall be submitted with each Proposal as a guarantee that if the Proposal is accepted by the City of Marion a contract will be entered into and the performance of the contract properly secured.

The City of Marion, Indiana, proposes to complete financing arrangements for this improvement within a period of sixty (60) days after construction bids are received. The bid securities of all bidders except the security submitted with the lowest acceptable bid, will be returned within a twenty (20) day period following the time of receipt of the bids. The bid security of the lowest acceptable proposal will be returned on request after the City of Marion has made a conditional award to the successful bidder, if a satisfactory Performance Bond has been delivered to the City. The conditional award will not be in effect until the City of Marion has been successful in raising the required funds for payment of construction. Provided it proves impossible to raise the required funds, the conditional award will be canceled by the City and the City shall not then be liable for any payments whatsoever to the Contractor. Extension of time beyond the sixty (60) day period of the conditional award may be made only by mutual agreement between the City of Marion, the Contractor, and the Contractor's Surety.

All proposals shall include Non-Collusion Affidavit, as prescribed by law, and shall be accompanied by a fully prepared and executed Questionnaire General Form No. 96-A as prescribed by the State Board of Accounts of Indiana.

Wage rates on this work shall not be less than the prescribed scale of wages as determined pursuant to provisions of Chapter 319 of the Acts of the General Assembly of Indiana of 1935, and as set forth in this document.

The City of Marion reserves the right to reject any or all Proposals and to waive any informalities or irregularities in the bids received or to accept any Proposal which is deemed most favorable to the City at the time and under conditions stipulated in the Instructions to Bidders.

The successful bidder will be required to furnish a satisfactory Performance Bond in the sum of the full amount of the contract.

In general, the improvements on which Proposals are requested will require the following construction:

DIVISION A—SEWAGE TREATMENT PLANT ADDITIONS

The construction of additions to the existing sewage treatment plant includes a new Garbage Building, two (2) digesters and control buildings, additional primary settling tanks, aeration tanks, and final settling tanks, the addition of equipment and accessories to the existing Compressor Building, remodeling work in the existing Digester and Service Building, and miscellaneous outside improvements. The Kraus Interchange Process will be incorporated into the enlarged plant, which will have a nominal capacity to give complete treatment to a sewage flow of 12 M.G.D. The proposed contract includes the furnishing of all labor, materials, and equipment for a complete operating installation.

Alternate Proposals are solicited on Major Items of Equipment as supplied by several manufacturers.

DIVISION B—WEST BANK INTERCEPTOR

The furnishing and installation of approximately 6,200 feet of 36 inch reinforced concrete pipe intercepting sewer, and 425 feet of 30 inch cast iron pipe river crossing, including manholes, Diversion Chamber, and appurtenances.

DIVISION C—SOUTH TRUNK INTERCEPTOR

The furnishing and installation of approximately 15,500 feet of reinforced concrete pipe intercepting sewers ranging from 24 inches to 42 inches in diameter, including manholes, headwall, and appurtenances.

DIVISION J—38th STREET SANITARY RELIEF INTERCEPTOR

The furnishing and installation of approximately 9,300 feet of reinforced concrete pipe intercepting sewer 72 inches in diameter, including manholes, headwall, and appurtenances.

DIVISION K—SOUTH SIDE SANITARY RELIEF SEWERS

The furnishing and installation of approximately 13,800 feet of reinforced concrete pipe trunk and branch sewers ranging from 24 inches to 54 inches in diameter, and 12,100 feet of vitrified clay pipe branch and lateral sewers ranging from 12 inches to 21 inches in diameter, including manholes and appurtenances.

DIVISION M—LOMAX STREET PUMPING STATION AND SEWERS:

The construction of a new Pumping Station located near Lomax Street and First Street. It will have a nominal capacity of 28 M.G.D. Construction will also include the furnishing and installation of approximately 710 feet of reinforced concrete pipe sewers ranging in size from 30 inches to 27 inches in diameter, and of approximately 1,090 feet of vitrified clay pipe sewer ranging in size from 21 inches to 10 inches in diameter, including manholes and appurtenances.

Alternate proposals are solicited on Major Items of Equipment as supplied by several manufacturers.

Plans and Specifications for this project were prepared by Consoer, Townsend and Associates, Consulting Engineers, 360 East Grand Avenue, Chicago 11, Illinois.

Dated at Marion, Indiana,
This 8th day of September, 1960.

CITY OF MARION, INDIANA
Board of Public Works and Safety
David L. Kiley, City Attorney
James Hamilton, City Controller
Gurdon Huntington, City Engineer

ATTEST:
Mrs. Verna Hays
City Clerk

Many contractors depend entirely upon the

OFFICIAL PROPOSAL COLUMNS

of

Engineering News-Record

for Opportunities to bid. They might not see your announcements if printed elsewhere.

◆

You undoubtedly want their bids on your contracts. Make sure of them on your next contract.

◆

The cost is only $2.40 a line per issue.

OFFICIAL PROPOSALS

Bids: October 3, 1960

Spruce Run Reservoir Project Culverts and Bridge on Relocated Road

CONTRACT SR-2

SEALED BIDS will be received from bidders by the Department of Conservation and Economic Development at its office, first floor, 205 West State Street, Trenton, N. J., at 11:00 A.M. Eastern Daylight Saving Time (10:00 A.M. Eastern Standard Time) on Monday, October 3, 1960, and will be opened and read immediately thereafter, for the construction of two reinforced concrete box culverts with clear spans of 10 and 15 feet, respectively, a reinforced concrete bridge across Spruce Run with two spans of 30-feet each and channel excavations, all as set forth in the specifications. The culverts and bridge are located on the proposed relocated Spruce Run road, located in the Townships of Lebanon and Union, Hunterdon County, N. J. Bids will be accepted only from bidders prequalified with the N. J. State Highway Department in accordance with R. S. 52:35.

The bid, accompanied by a certified check drawn to the order of the Treasurer of the State of New Jersey in an amount of not less than 5 percent of the bid, an Agreement of Surety, an Affidavit of Non-Collusion, an Appointment of Agent by Non-resident Bidders and a Revised Financial Statement and Plan and Equipment Statement on prequalification forms, must be enclosed and sealed in an envelope provided for that purpose by the Department. Bids not so submitted will be considered informal and will be rejected. Bids must be delivered at the above place on or before the hour named, as no bids will be accepted after the hour specified.

Pamphlets containing information for bidders, forms of bid and contract, specifications, contract drawings, requirements as to surety, etc., can be obtained in the office of the Chief Construction Engineer of the Bureau of Design and Construction of the Division of Water Policy and Supply of the Department of Conservation and Economic Development, 219 West State Street, Trenton, N. J., upon application in person or by mail, by depositing the sum of $10.00 for each set of pamphlets, this deposit to be refunded to the bidders upon return of such documents in good condition within 30 days after the award of the contract. Prospective bidders desiring blueprints of the contract drawings for their own use may secure same, the cost thereof to be paid by them. For further particulars apply at the office of the Chief Construction Engineer.

The Commissioner reserves the right to select the bid the acceptance of which will be most advantageous to the State, price and other factors considered. Any and all bids may be rejected when the Commissioner determines that it is in the public interest so to do.

Salvatore A. Bontempo
Commissioner of Conservation
and Economic Development

Bids: September 30, 1960

Round Valley Reservoir Project Relocated Lebanon-Stanton Road

CONTRACT RV-3

SEALED BIDS will be received from bidders by the Department of Conservation and Economic Development at its office, first floor, 205 West State Street, Trenton, N. J., at 11:00 A.M. Eastern Daylight Saving Time (10:00 A.M. Eastern Standard Time) on Friday, September 30, 1960, and will be opened and read immediately thereafter, for the grading of approximately 2.55 miles of new relocated road, the paving of approximately 2.22 miles of the above with bituminous macadam and other appurtenant work, all as set forth in the specifications. The new relocated road is a portion of the existing Lebanon-Stanton road beginning at McPherson's Corners and running in a northerly direction west of the proposed Round Valley Reservoir to a point west of the proposed dike. The work is located south of the Borough of Lebanon in the Township of Clinton, Hunterdon County, N. J. Bids will be accepted only from bidders prequalified with the N. J. State Highway Department in accordance with R. S. 52:35.

The bid, accompanied by a certified check drawn to the order of the Treasurer of the State of New Jersey in an amount of not less than 5 percent of the bid, an Agreement of Surety, an Affidavit of Non-Collusion, an Appointment of Agent by Non-resident Bidders and a Revised Financial Statement and Plan and Equipment Statement on prequalification forms, must be

OFFICIAL PROPOSALS

enclosed and sealed in an envelope provided for that purpose by the Department. Bids not so submitted will be considered informal and will be rejected. Bids must be delivered at the above place on or before the hour named, as no bids will be accepted after the hour specified.

Pamphlets containing information for bidders, forms of bid and contract, specifications, contract drawings, requirements as to surety, etc., can be obtained in the office of the Chief Construction Engineer of the Bureau of Design and Construction of the Division of Water Policy and Supply of the Department of Conservation and Economic Development, 219 West State Street, Trenton, N. J., upon application in person or by mail, by depositing the sum of $25.00 for each set of pamphlets, this deposit to be refunded to the bidders upon return of such documents in good condition within 30 days after the award of the contract. Prospective bidders desiring blueprints of the contract drawings for their own use may secure same, the cost thereof to be paid by them. For further particulars apply at the office of the Chief Construction Engineer.

The Commissioner reserves the right to select the bid the acceptance of which will be most advantageous to the State, price and other factors considered. Any and all bids may be rejected when the Commissioner determines that it is in the public interest so to do.

Salvatore A. Bontempo
Commissioner of Conservation
and Economic Development

U. S. Government

DEPARTMENT OF THE INTERIOR, Bureau of Reclamation. Sealed bids (Specifications No. DC-5400) will be received at East Wenatchee, Washington until 10 a.m., Pacific Standard Time, October 27, 1960, for furnishing labor and materials for River and Booster Pumping Plants, Discharge Line and 2,000,000-gallon Reservoir, East Unit, Washington, Chief Joseph Dam Project. Location near Wenatchee, Washington. Principal items are Schedule No. 1, 85,000 cu. yds. excavation; 2,600 cu. yds. concrete; and 2,000,000 pounds of furnishing and installing 36½-inch, 42½-inch and 49-inch O.D. steel pipe in discharge line. Alternate Schedule No. 2, 76,000 cu. yds. excavation; 2,600 cu. yds. concrete; 8,135 lin. ft. of 36-inch and 42-inch PT concrete pipe; and other work. Completion time 700 days. For particulars, address Bureau of Reclamation, P. O. Box 937, Boise, Idaho; P. O. Box 0219, East Wenatchee, Washington; or Building 53, Denver Federal Center, Denver 25, Colorado. Floyd E. Dominy, Commissioner.

Sealed bids from Small Business Concerns for Airconditioning Phase II U. S. Post Office, Grand Central Station Annex (45th St. & Lex. Ave). New York, N. Y., will be received until 2:00 P.M., E.D.S.T., October 24, 1960, and then publicly opened. Bidding material may be obtained after September 23, 1960 from the Business Service Center, General Services Administration, 250 Hudson Street, New York 13, N. Y.

EMPLOYMENT — NATIONAL COVERAGE — OPPORTUNITIES

DISPLAYED RATE:

The advertising rate is $39.20 per inch for all advertising appearing on other than a contract basis. Frequency rates quoted on request.

An advertising inch is measured ⅞" vertically on a column—3 columns—30 inches to a page.

Subject to Agency Commission.

OCT 6TH
ISSUE
CLOSES
SEPT 26TH

UNDISPLAYED RATE:

$2.40 per line, minimum 3 lines. To figure advance payment count 5 average words as a line.

Position Wanted ads take ½ of above rate.

Box numbers—count as 1 line.

Discount of 10% if full payment is made in advance for 4 consecutive insertions.

Not subject to Agency Commission.

Send NEW Ads and Inquiries to Classified Advertising Division of ENGINEERING NEWS-RECORD, P. O. Box 12, N. Y. 36.

ADDRESS BOX NO. REPLIES TO: Box No.
Classified Adv. Div. of this publication.
Send to office nearest you.
NEW YORK 36: P. O. Box 12
CHICAGO 11: 520 N. Michigan Ave.
SAN FRANCISCO 4: 68 Post St.

• *POSITIONS VACANT*

Field Supervisor. Large established midwest consulting firm has permanent position in building construction supervision for thoroughly qualified and experienced man. Mechanical engineer preferred. Moving expenses paid. Send complete resume to P-4833, Engineering News-Record.

Bridge and Highway Supt. for well established Mid-west contractor. Applicant must be capable of handling complete phases of joint venture highway work and must have a detailed knowledge of bridge formwork including wet piers. Excellent opportunity and salary for qualified man. Engineering background preferred. Please reply giving experience record, salary desired, etc. P-5207, Engineering News-Record.

Engineer, R & D, graduate CE or ME, age 25-40. Work includes technical writing, consultation, research and development relating to the curing of concrete products with steam at high pressure. Permanent position. Applicants furnish photo and complete resume including salary desired in first letter. Location Washington, D. C. P-5219, Eng. News-Record.

Draftsmen, Structural-Experienced checkers and detailers of structural steel shop drawings. Permanent position. Fink and Zwecker Co., 1100 Crescent Ave., N.E., Atlanta 9, Ga.

Project Engineer for large Capehart Housing Project in Missouri. Age to 35. Please send resume and salary requirements to P-5270, Engineering News-Record.

• *POSITIONS VACANT*

Plant superintendent required—experienced in prestressed precast concrete. Steady employment. Fenrich Prestressed Concrete, 1-340-58 Ave., Edmonton, Alberta, Canada.

Sales Engineer for wellpoint dewatering in various sections of the country. Engineering background, civil preferred. Alternate at least 5 years experience in supervisory capacity in heavy construction work. Excellent opportunity. State age, education experience, marital status. P-5241, Engineering News-Record.

Permanent Position: Structural engineer with Ph.D. or M.S. degree from well recognized engineering school. Well grounded in the Theory of Elasticity to handle complex indeterminate structures. Excellent living conditions, good future for young and responsible engineer. Submit Graduate School credits. Location North Carolina. P-5231, Engineering News-Record.

Project Superintendent for large Capehart Housing Project in Missouri. This position requires a man of outstanding organizational and supervisory ability. Please send resume and salary requirements to P-5281, Engineering News-Record.

Building Supt. for well established General Contractor operating in three state Mid-west area. Excellent opportunity for superintendent thoroughly grounded in form work and management of large sized institutional and commercial work. Please reply giving experience record, salary desired, etc. P-5201, Engineering News-Record.

Assistant To City Engineer. Salary to $6,588. Fringe benefits. Opportunity for varied design and construction experience. Large city planning, street, sewer and expressway programs under way. Write City Manager, Zanesville, Ohio before November 1.

(Continued on the following page)

ENGINEERS DESIGNERS

Permanent positions with Arthur G. McKee & Company in Cleveland for:

ENGINEERS, DESIGNERS, DRAFTSMEN

experienced in design work on Oil Refineries, Chemical Plants, Heavy Industry or any type of Steel Plant or Steel Plant Equipment design. Applications will be kept confidential.

Send detailed resume and photo to:

G. VICTOR HOPKINS
ARTHUR G. McKEE & COMPANY
2300 Chester Avenue, Cleveland 1, Ohio

• *POSITIONS VACANT*

(Continued from preceding page)

Senior Cost Engineer. Must be familiar with the Uniform System of Accounts for Electric Utilities. Duties will consist of analyzing completed major construction projects for an Electric Utility. Experience with the Federal Power Commission or a State Public Service Commission would be desirable. Some experience with the Property Record Department of any Electric Utility would also be an asset. Please send complete information on experience, references, salary requirements, and availability. Indianapolis Power & Light Co., 25 Monument Circle, Indianapolis 6, Indiana, Employment Division.

Wanted Engineers—Five years general experience, married without children, for Pitometer Surveys of municipal water distribution systems. Permanent position with frequent location changes. Salary open. Profit Sharing. The Pitometer Associates, 50 Church Street, New York City.

Permanent position open for civil engineer with 5 to 10 years general experience in municipal engineering. Must have substantial experience in water and sanitary engineering fields, including treatment works. Salary open. Age limit 40 years. Reply to Parker and Associates, Consulting Engineers, 1714 9th Street, Greeley, Colorado.

Estimator—Engineer; Progressive, Expanding commercial and industrial building contractor in Louisville, Ky. Requires young man with growth potential. Two years minimum experience. Grow with the South. Replies held strictly confidential. Our employees know of this ad. Write brief resume, salary expected, and availability to P-5323, Engineering News-Record.

Sanitary Engineers (a) Over 10 years experience design water supply, sewerage, drainage (b) 5-10 years experience same field. Salaries open depending upon qualifications. Clinton Bogert Engineers, 145 East 32nd Street, New York City.

Sewer Superintendent—Kansas City Area. Long Established Contractor has permanent opening for experienced qualified man. Age no barrier. Must be able to produce. P-5315, Engineering News-Record.

Plant superintendent for large eastern crushed stone and bituminous concrete manufacturing company which operates plants in New York, Pennsylvania, and Virginia. Engineering background required. Age from 30 to 40 years. Salary commensurate with experience. Excellent employee benefits provided by Company. Please send complete resume. P-5296, Engineering News-Record.

Civil Engineer (Sanitary Engineering) for positions in Los Angeles County Flood Control District. Must have one year's experience in sanitary engineering & at time of appointment, a Calif. State Certificate of Registration as a Civil Engineer. Sal: $889 month. Work involves water conservation, underground water supplies sea water intrusion, sewerage reclamation, etc. Apply Mr. Pronk, Flood Control District, 2250 Alcazar St., Los Angeles 33, California.

Municipal Engineer Kitimat, B.C., Canada. Responsibilities include the direction of the design, construction and maintenance of roads, sewer and water facilities. The successful applicant will be a professional engineer with experience in municipal engineering and works activities. Salary range: $8,400-$12,000. Mail complete resume of education, experience, age and present salary to: Municipal Manager, Box 400, Kitimat, B.C. The Corporation of the District of Kitimat.

Wanted—Engineer experienced in highway maintenance and familiar with highway department methods and organization for South America assignment. Speak Spanish. Send resume. Rader and Associates, First National Bank Bldg., Miami, Fla.

• *POSITIONS VACANT*

Water Manager: City of 12,000 requires a Water Manager who should be a graduate engineer with at least three years experience including one in utility management. Appropriate experience may be acceptable in lieu of college degree. Water system includes wells, pumping stations, tanks, and distribution mains. Salary commensurate with ability and experience to $7,200 maximum plus benefits. Director of Public Works, Cambridge, Maryland.

• *EMPLOYMENT SERVICE*

Better Positions—$6,000 to $35,000. Want a substantial salary increase, more opportunity or different location? This national 49 year old service connects you with best openings. You pay us only nominal fee for negotiations: This we refund when employer pays placement fee. Present position protected. In complete confidence, write for particulars. R. W. Bixby, Inc., 559 Brisbane Bldg., Buffalo, N. Y.

• *POSITIONS WANTED*

Chief Estimator-Project Manager — Fully qualified to handle work from bidding stage to completion. Best of references. Building Construction, Heavy Construction, Sewage and Water Treatment Plants PW-5011, Engineering News-Record.

Engineering Executive. Wide industrial, chemical and civil experience: all phases administration and management. Organize and direct large design jobs or work in consulting and exec. asst. capacities. Proposals, reports, contracts, liaison, trouble shooting, P.E. in 5 States. PW-4725, Engineering News-Record.

Construction Engineer, Contract Administrator—BSCE—age 25—four years experience in engineering construction—supervision, inspection, contract administration—prefer foreign assignment—military obligations completed—available 1 November. PW-5163, Engineering News-Record.

Civil—Structural Engineer, degree. 15 years design experience in all types of structures. Reinforced concrete, structural steel, prestressed concrete. Desire a position. Available at a notice. PW-5146. Engineering News-Record.

Executive: Excellent legal-construction background, exp. all phases construction field & central office, administrator, mgr. atty. govt contracts, employed, female. PW-5145, Engineering News-Record.

Superintendent 41, BSCE., Reg. Sound experience in general construction, estimating and layout, office work. Want opportunity with medium size progressive organization. PW-5157, Engineering News-Record.

Structural Engineer—Graduate, Registered, 8 years experience fabrication and design structural steel desires responsible position with fabricator. PW-5202, Eng. News-Record.

Superintendent-Engineer, experienced in strip mining and earth moving. Now employed, available soon. PW-5262, Eng. News-Record.

General Manager; 41 yrs. old. Fully experienced in all phases of Heavy, Highway, and Airport Construction business. Prefer west of Mississippi River. References. Available for interview. R. E. Phillips, 512 Conkey, Burlington, Wis. Ph. Rockwell 3-7549.

Project Management, Contract Admin. 22 yrs. hvy. constr. including estimating, procedures, supervision, claims. Major projects U. S. & O. S. PW-5263, Eng. News-Record.

Cost Engineer—Degrees in engineering and accounting; 12 years experience chemical and petrochemical plant estimating, cost control, cost analysis, and engineering economic evaluation; available immediately; excellent references. PW-5259, Eng. News-Record.

Water Work-Irrigation: Project Eng. BSME married 33. Past 6 years experience in equipment design and installation, 3 years construction exp. Foreign only. PW-5268, Engineering News-Record.

Manager of Construction—twenty-five years corporate engineer in charge of profitability analysis, cost estimating, scheduling, construction supervision and cost control for major process industry projects. On-time completions, minimum costs, smooth startups. PW-5267, Engineering News-Record.

Registered Engineer, 34, married, M.S. in C.E., structural, with 12 years experience in design of buildings, industrial structures and bridges, desires position with responsibility and future. Resume upon request. PW-5258, Engineering News-Record.

• *POSITIONS WANTED*

Proj. Mgr. or Heavy Const. Sup't. 14 yrs. exp. road & bridge const. Engineering, estimating, & supervision. Incl. 4 yrs. operating self-owned bridge constr. co. $500,000. annual gross. Avail. immed. Will relocate. PW-5195, Engineering News-Record.

Project Manager—Const Supt, Flood Control, Roads, Tunnels, Bldgs, Excellent Mechanical Background, Immediately available, 9238 E. Parkhill Drive, Bethesda 14, Md, 01 2-6196.

Assistant Superintendent: Over 10 yrs. in supervisory capacity on Industrial Bldgs., Hospitals & Super Highways. Field lay-out & proj. engineering background. J. T. Hock, 808 W. Walnut, Robinson, Ill., Phone 973-WX.

Gen Supt. or Supt.—35 years experience— Major project-heavy constr. West Pointer. At present employed on one of the Niagara Power Project as, Gen Supt., desire change. My experience cover thorough work on, dams (both earthfill hydro), bridges, Pile Driving. Mass earth and Rock excavation, (including drilling and blasting) Waterworks, Docks, Cuffer Dams, Foundation, Mass Concrete; Pumpcrete, form work, Tunnels, Rigging. Expert organizer. Resume on request. PW-5317, Engineering News-Record.

Project Manager or Superintendent. BSME Reg. Eng. Md. Age 45. Experience: Bridges, Tunnels, Pipe lines, Pumping Stations, Piers, Jetties, Bulkheads, Hydraulic fills, and dredging. Handle projects from bidding to completion. PW-5326, Engineering News-Record.

Engineering Executive — Overseas — South America preferred — Age 30-MSCE — Reg. Prof. Eng. Ohio, Mich.—Fluent Spanish 10 yrs. exp. Industrial Plants—Mach. layout—Struct. Design Conveyor systems—Material handling—Presently chief Engr. consulting office. PW-5314, Engineering News-Record.

Manager—Reg. C.E. (Pa.) Presently managing diverse maintenance and lt. const. organization (220 People) Interested in similar position with good potential. Prefer Mid. Atlantic location. Age 36. Salary $12,000. PW-5316, Engineering News-Record.

Experienced—Competent Estimator & Office Engineer, available 1st of October. Industrial & Commercial buildings, Heavy Const. experience. Arch. Eng. Background. Now Project Engineer on Government Missile Contract. Age 35. Resume on request. Minimum salary $9600. Can relocate within USA. Would consider overseas assignment. PW-5292, Engineering News-Record.

Construction Manager or General Superintendent Civil engineer registered in Pennsylvania. Twenty-five (25) years experience in general construction field including engineering consultation with owners, site and location study, design and preparation of plans, estimating, submitting proposals, purchasing, negotiating subcontracts, and organizing, scheduling and supervising project. Salary $10,000.00. PW-5285, Engineering News-Record.

Young College Graduate, 10 years experience as Structural Ironworker, 3 years as Sales Engineer—construction equipment, desires interesting, challenging position in related field. PW-5287, Engineering News-Record.

Over 25 yrs. exp. steel estimating, detailing, checking, purchasing, supervising, contract negotiations as part owner successful job shop in Hawaii fabricating and erecting light and medium structural steel, plate and misc. iron work. Business recently sold to large corporation. Am desirous of locating in South Texas. Alternates San Diego, Phoenix, Los Angeles or similar climes. Married, age 54. Leaving for mainland early October. Will appear for interview in response to worthwhile offers. PW-5325, Engineering News-Record.

Construction Superintendent—Estimator 23 years experience best types building construction. PW-5327, Engineering News-Record.

SELLING OPPORTUNITY WANTED

Construction Product Sales? Need representation east of the Mississippi? Two or more graduate engineers with sales and management background available for challenging assignment. Promotion and/or sales to all applicable markets. Replies on your letterhead promptly answered. RA-5286, Engineering News-Record.

Pennsylvania Department of Highways Offers
Challenging opportunities in the PHILADELPHIA AREA for

HIGHWAY DESIGNERS

with C.E. degree and several years of design experience

*** 5 JUNIOR DESIGNERS * 3 DESIGNERS * 1 SQUAD LEADER**

Starting salaries from $5500 to $7800 per year.
Permanent positions. Excellent growth potential. Fringe benefits.

Send Resume To:

PERSONNEL, PENNA. DEPT. OF HIGHWAYS, HARRISBURG, PA.

DRAFTSMAN

For detailing Reinforcing Steel, Steel Joists, and similar products. Only those experienced in this or allied fields will be considered. Permanent position, air-conditioned office, 40 hour week, retirement plan, paid vacations, hospitalization and Group insurance plans. Location Richmond, Virginia.

Reply giving brief resume of experience, education and salary expected.

P-5188, Engineering News-Record
Class. Adv. Div., P.O. Box 12, N.Y. 36, N.Y.

ESTIMATOR-QUANTITY SURVEYOR

Experienced on industrial and commercial building construction. Prefer engineering background. Location Southeastern States. Send complete resume and reference first letter.

P-5249, Engineering News-Record
Class. Adv. Div., P.O. Box 12, N.Y. 36, N.Y.

---

structural steel estimator

For permanent position in estimating department of well established structural steel fabricator and erector located in the Philadelphia, Pennsylvania area. Must have experience in structural steel estimating. Send full resume of experience and salary expected to:

P-5299, Engineering News-Record
Class. Adv. Div., P.O. Box 12, N.Y. 36, N.Y.

FOREIGN POSITIONS available for any personnel experienced in maintenance of military installations. ONLY TOP LEVEL APPLICANTS WILL BE CONSIDERED IN THE FOLLOWING CLASSIFICATIONS: Project Managers, Site Managers, Base Engr. Supt., R & U Supts., Chief Engineers, Utilities Supts., Maintenance and Repair Supts. Send complete resume, photograph, dates of availability and status of passport to: **P. L. Monts, P. O. Box 538, Terre Haute, Indiana**

CHIEF ESTIMATOR

HEAVY CONSTRUCTION

IMMEDIATE OPENING

YOUNG, rapidly expanding ($70 million in active contracts) nationwide construction company wishes to discuss your qualifications if you have substantial, successful experience as Chief Estimator on varied competitively bid complex work involving bridges, dock construction, locks and dams, etc., and seek greater future opportunities with growing firm.

An exceptional opportunity to offer a top-flight man now.

Mail complete and confidential resume to:

P-5245, Engineering News-Record
520 N. Michigan Ave., Chicago 11, Ill.

WANTED

ENGINEERING ASSOCIATES

SANITATION WATER SUPPLY
(foreign & domestic)
PETROLEUM (foreign)
GEOLOGICAL & MINING (foreign)
CHEMICAL & PETRO-CHEMICAL
(foreign and domestic)
WATER RESOURCES (foreign)
HYDRO-ELECTRIC (domestic & foreign)
CONSTRUCTION (domestic & foreign)

President and Vice-President levels.
Complete charge of your own division.
Drawing account against substantial share of Division profits before tax PLUS income from own secured investment.
Minimum Investment $25,000.00
GLOBAL Activity—TOP Recognition

Send complete resume including photo to:

P. O. Box 968,
Station "B", Montreal, Quebec

MATERIALS ENGINEERS

Eastern Consultant wants several graduate engineers well rounded in highway materials control, including knowledge of highway construction, in several grades. Minimum age 33 years. Salary ranges $8,500 to $10,500 and $10,500 to $12,000 depending on age & experience.

P-5250, Engineering News-Record
Class. Adv. Div., P.O. Box 12, N.Y. 36, N.Y.

ENGINEERS

Permanent openings for qualified

CIVIL

Several openings for experienced persons in design of structural steel and reinforced concrete applicable to design of Bridges and Buildings. Opening for Sanitary major in design of sewage and waste disposal systems.

ELECTRICAL

Need several in the design and layout of Power Plants, Test Facilities, Industrial and Institutional projects.

MECHANICAL

Several openings for men experienced on Process Piping design and layout, preparation of Flow Diagrams, and cost estimates.

Also openings for Designer-Detailers and Draftsmen.

Positions open to Engineers desiring long range employment with opportunity for professional development. Many company benefits, including paid vacations, sick leave, holidays. Excellent employee benefit plan.

Write fully, include complete experience and salary data.

SVERDRUP & PARCEL
ENGINEERING COMPANY
Engineers — Architects
915 Olive St., St. Louis 1, Mo.

ENGINEERS AND MATERIALS INSPECTORS *WANTED*

TVA has openings in a large hydro- and steam-electric program for experienced civil, structural, electrical, and mechanical engineers in its Division of Design located in Knoxville, Tennessee, and for materials engineers and inspectors of materials located in various district offices, principally in the north and east.

These positions are at the following grades and rates of pay:

Civil, Mechanical, Electrical and Materials Engineers, grades SD-2 and -3	**$6400-$7400**
Inspectors of Materials, grades SE-5 and -6	**$5990-$6800**

The engineering jobs require a college degree in engineering or its equivalent and from one to three years of experience in design and specification work, or in inspection and testing work for materials engineers. The inspector of materials jobs require some college training in engineering or equivalent training and experience in making engineering inspection and tests of mechanical, structural, and electrical equipment and materials.

All jobs carry automatic within-grade increases for satisfactory service, liberal vacation leave, sick leave, retirement, and medical and life insurance benefits.

Write to:

TENNESSEE VALLEY AUTHORITY
Division of Personnel
Knoxville, Tennessee

SEARCHLIGHT SECTION CLASSIFIED ADVERTISING

Send New ADS or Inquiries to Class. Adv. of Engineering News-Record, P. O. Box 12, New York 36, N. Y.

FOR SALE—LIKE NEW

THE BEST TUNNEL GATES BY A DAM SITE!

21—Fixed Wheel Gates for 16' x 19' Tunnel closure under 80' Head (34 tons ea. gate.)

4—Fixed Wheel Gates for 15' x 31' closure

4—Fixed Wheel Gates for 15' x 35.5' closure under 44' head high velocity flow (43 tons ea. gate)—Fully complete with:

8—100 ton capacity hoists with 50 HP GE elect. motors, gear reduced for raising and lowering gates.

Complete G.E. Motor Control Center (12 panels)—

2—225 KVA Transformers—2400/480V 3 phase; 8-stop logs and lifting beam; Suspension bars, rubber seals, hardware, etc.

Photos & Drawings available. All or part of equipment for sale at fraction original cost.

F O B Loaded R.R. cars, Massena, NY

Apply: Gilbert Matlow
ABE COOPER-WATERTOWN CORPORATION
Factory Square—Watertown NY—*Tel: SUnset 8-5500*

FOR SALE

Located in Central United States:

Plymouth 5 Ton Locomotive, 24" gauge diesel
Eimco #401 Air Locomotive, 24" gauge
20—2½ c.y. Dump Cars, 24" gauge with couplers

Located on East Coast:

4 Conway, Type 75, Mucking Machines
1 Double Drum Wellman-Seaver-Morgan Hoist, 300 H.P.

Located on West Coast:

8—60E12 Diesel Electric Joy Shuttle Cars
4—J.S.L.—7 Joy Loaders
1—430 K.W. Generator operated by four 4—71 G.M. Diesel Motors including Switchgear
12,000' of 36" steel Fan Line, Spiral Weld with Couplings
20,000' of 6" steel Spiral Welded Pipe with Couplings
4 000' of 4" steel Spiral Welded Pipe

FRAZIER-DAVIS CONSTRUCTION CO.
1319 Macklind Avenue St. Louis 10, Mo.

High Speed in 6x6's
NEW ISSUE TRUCKS
GMC! MACK! REO "Eager Beaver!"
• *Tandem Axle* • *Front Wheel Drive*
For specifications, prices, delivery, write
MEMPHIS EQUIPMENT COMPANY
P.O. Box 2852, Dept. E., Memphis, Tenn.
NATION'S LARGEST ARMY TRUCK DEALER!

FOR SALE OR RENT

1—Cleveland Heavy Duty Mesh Bridge 20'-25' width 4 single flanged wheels—New
1—Marion 35-M Truck Crane with 60' boom—New
1—Lorain Model 820-K Diesel Shovel 2 Cu. Yd.—Used
1—Unit Model 1020 Shovel with GM Diesel Engine—Used
2—LeTourneau-Westinghouse C Tournatractors—Used
2—LeTourneau-Westinghouse Super A Tournapulls—Used

FURNIVAL MACHINERY CO.
54th & Lancaster Ave., Phila., 31, Pa.
TRinity 7-5200

FOR SALE

1—Gradall Model 2460

with 36" digging bucket, 8' grading blades, ripping tooth and other accessories. Used approximately 500 hours.

1—Model 123 Eimco Front-End Loader,

2 cu. yd. rock bucket, electric starting and other accessories.

1—Model 123 Eimco Front-End Loader,

2 cu. yd. rock bucket, rear attached, hydraulically operated ripper, and other accessories.

Other Equipment Available:

Gardner-Denver PR 123 Rock Drills, Chain Feeds, Hammers, Sinkers, Drill Jumbo, and other Contractor Tools.

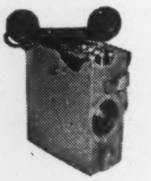
All Equipment in excellent condition.

KAISER-RAYMOND-MACCO-PUGET SOUND
P. O. Box 295 Mountain Home, Idaho
Phone: JUniper 7-4483, John G. Aiello

9—"EUC" BOTTOM DUMPS

25-Yd. #11LBT-105W's—With 400 HP Hall-Scott Butane engines. All located in Waddington, N. Y. Buy for 10% of new machine or $7500 each.

PACE-EUCLID, INC. 3001 N. 7th St.
Kansas City, Kns. Finley 2-8974



U. S. Army Telephones EE-8 fully reconditioned. Suitable for intercommunication between 2 or more points. $35.00 for 2 telephones, including 100 ft. of wire and batteries. Additional wire 1¢ per ft. or $25.00 per mile. Write for free list on telephones. All shipments F.O.B. Simpson, Pa.

TELEPHONE ENGINEERING CO.
Dept. ENR-100 Simpson, Pa.

STRUCTURAL ENGINEERING
ARCHITECTURAL ENGINEERING
OUR COURSES of instruction by mail HAVE HELPED THOUSANDS to better positions and to pass State Board Examinations Forty-eighth year.
Write today without obligation
WILSON *Engineering Corp.*
College House Offices HARVARD SQ. CAMBRIDGE MASS.

CONSTRUCTION SUPERVISION

Exclusive Training Course by mail for top positions. Publishers Manual of Advanced Construction Management. Send postcard for details.

National Schools of Construction
Est. 1952
Satsuma, Florida

WANTED

¾ yd. Dragline Bucket

Light duty.

BAYLOR CONSTRUCTION CORP.
MUrray Hill 7-5577
in New York City

EUCLID SCRAPERS

6—14 TDT's, 18 yard Scrapers Good condition; $15,000 each. Located in Central Illinois.

Minnesota Branch
EUCLID DIVISION, GMC
3305 Republic Ave., Minneapolis 26, Minn.
WEst-9-2646

For Sale: DRAGLINES—SHOVELS—CRANES
All makes and models, ½ yd. to 35 yd.
EUCLIDS: Rear, Bottom Dumps and Scrapers
Other equipment available not listed above
William Lubrecht, III Construction Equipment
311 W. Diamond Avenue, Hazleton, Pa.
Gladstone 5-4041 5-0253

FOR SALE

Model 1005 Long Crawler Koehring Crane

19' overall length x 42" treads; 120' boom and jib; Cummins Diesel Torque Converter; used for steel erection only. CONDITION PERFECT—Firm Price $60,000. Located within 100 miles New York City.

CONSTRUCTION EQUIPMENT CORPORATION
Long Island City, N. Y.

SURVEYING INSTRUMENTS

USED • REBUILT • SALE
RENT • REPAIRING

TRANSITS & LEVELS

Various Makes

NEW & REBUILT

Fully equipped modern shops — all makes and models repaired — all work guaranteed — prompt service — complete line field supplies.

INSTRUMENTS RENTED

Midwest Distributors for W. & L. E. Gurley and Wild Heerbrugg Instruments

NATIONAL BLUE PRINT CO.
Established 1914.
210 S. Canal St. Chicago (6), Ill.

FOR SALE

USED STEEL

BEAMS—8" to 36" WF, H & I
CASING & PIPE 12" to 10' dia.
B.P.'s—PLATE—ANGLES

WANTED: YOUR SURPLUS STEEL

LEOPOLD COHEN IRON CO.
3000 S. Kedzie Ave., Chicago 23, Ill.

AIR COMPRESSOR

6700 C.F.M. Sullivan 2 stage Model HE522 30½" & 18½" x 20" direct connected to 1250 H.P., G.E. Syn. Motor—200 R.P.M. 3/60/4160 V.

B. M. WEISS CO.
Girard Trust Bldg. Philadelphia 2, Pa.

PIPE

Surplus New & Used
FOR SALE, WANTED OR RENT

Call: HYacinth 7-4900

PIPE, VALVES & FITTINGS
PILING • CULVERTS
ASBESTOS-CEMENT PIPE • ALUMINUM PIPE

ALBERT PIPE SUPPLY CO., Inc.
103 VARICK AVE., BROOKLYN 37, N.Y.

PIPE **PIPE**

2,000,000 ft.	2"	3.50# to the foot
1,000,000 ft.	3"	7.70#
1,000,000 ft.	4"	10.98#
500,000 ft.	6"	19.80#
200,000 ft.	8⅝"	28#
400,000 ft.	10¾"	35#
75,000 ft.	12¾"	40#
10,000 ft.	16"	42#

All No. 1 Grade Plain End and Cleaned
INDIANA-OHIO PIPE CO.
P. O. Box 5412 Shepard Station, Tel: CL-3-5527
COLUMBUS 19, OHIO

ASSOCIATED PIPE & FITTING CO., INC.

PILING PIPE SHELLS MANDREL FITTINGS
"H" BEARING PILE SLEEVES AND SHOES
K & M ASBESTOS CEMENT PIPE
CULVERTS CIRCLE ARCH SECTIONAL

262 RUTHERFORD BLVD., CLIFTON, N.J. • PR 3-8400

RAILS-TIES

TRACK ACCESSORIES

RAILS

MIDWEST STEEL CORP.
502 DRYDEN STREET
CHARLESTON, W. VA.

RAILS - TIE PLATES

Frogs & Switches—Track Accessories
W. H. DYER CO., INC.
1811-X Railway Exchange Bldg., St. Louis 1, Mo.
Operating Nationally

WHIRLER CRANES

2 AMERICANS—Model R20HHE
Boom 156'
Capacity 11 Tons @ 145' Radius
Portal Clearance 22' Rail to Boompin 105'
Gauge 42'
Available March 1, 1961

1 CLYDE—Model 24E130 + 10 Serial CW3745
Boom 140'
Capacity 11 Tons @ 145' Radius
Portal Clearance 29' Rail to Boompin 96'
Gauge 32'
—AVAILABLE NOW—

1 WASHINGTON Model 28-1-120K
Boom 137'
Capacity 11 Tons
Portal Clearance 21' Rail to Boompin 85'
Gauge 32'
—AVAILABLE NOW—

For complete specifications and price, contact:
ROCKY REACH CONTRACTORS
PO Box 1688, Wenatchee, Wash. Phone: NO 2-2154

PILE DRIVING EQUIPMENT

VULCAN AND McKIERNAN-TERRY
Steam Pile Hammers and Extractors

- DROP HAMMERS
- STEEL LEADS
- DRIVING CAPS
- PILE DRIVER HOSE
- HOISTS AND BOILERS
- STEEL SHEET PILING

CONMACO, INC.

DRexel 1-3930
820A KANSAS AVE.,
KANSAS CITY, KANS.

PILING

SURPLUS NEW and USED For Sale, Wanted or Rent

H & SHEET STEEL PILING

3700 PCS. BETH. SP6A, 50' 56' & 48' & 40' & 35'
1900 PCS. MP112—12', 25', 35' 40' 50' & 60'
2800 PCS. BETH.—AP3 15', 20', 25', 30', 35', 60'
2500 PCS. BETH.—DP2 20', 25', 30', 35', 40', 60'
1200 PCS ZP38-ZP32—25' 36', 50', 60' & 65'
1400 PCS. BP8, BP10, BP12—BP14—55' to 60'
600 PCS. BETH. ZP27—25', 30', 50' & 60'
500 PCS. 15' Corrugated Piling

PILING BOUGHT—SOLD—RENTED
STOCKS: N. Y.—BOSTON—BUFFALO
TORONTO—BALTIMORE—JACKSONVILLE
MIAMI—RICHMOND—NEW ORLEANS

DIESEL LOCOMOTIVES & CRANES
12—Gen. Elec. 100, 80, 65, 45, 25 & 23 ton
25 Ton Industrial Loco. Crane, 60' Boom

690 CFM ELEC AIR COMPRESSOR
YCB—Chgs. Pneu. 440V—Y Type

R. C. STANHOPE, INC.
60 E. 42nd St. N. Y. 17, N. Y.
Telephones MU 2-3075 or MU 2-1898

1500—H BEARING PILES

8" 36 lb. 10" 42 lb. 12" 53 lb. 14" 73 lb.
Stocks: Buffalo, N. Y., Baltimore, Md.
Albany, N. Y., Newark, N. J., Jacksonville, Fla.

R. C. STANHOPE, INC.
Tel. MU 2-3076 or MU 2-1898
60 E. 42nd St. N. Y. 17, N. Y.

NORTH—SOUTH, *EAST or WEST*

LOW RATES
FAST SERVICE
RENT, SELL OR BUY
NEW AND USED
SINCE 1933
H-BEARING PILE
PILE HAMMERS
NATION-WIDE STOCKS
ANY QUANTITY
ALL SECTIONS
ALL LENGTHS

STEEL SHEET PILING by DIALING
Call St. Louis Collect
CHestnut 1-4474

PILE DRIVING EQUIPMENT **AT YOUR FINGER TIPS**

MISSISSIPPI VALLEY EQUIPMENT CO.
1908 Railway Exchange Bldg.
St. Louis 1, Mo. CHestnut 1-4474

PROFESSIONAL SERVICES

MIDDLE ATLANTIC

Albert C. Jones Associates
Consulting Engineers
Private and Municipal Engineering
Sewerage-Sewage Treatment
Water Supply and Distribution
Investigations and Appraisals
Photogrammetric Engineering
Aerial Maps
223 High St. Mount Holly, New Jersey

Layne-New York Co., Inc.
Test Borings ● Core Drilling
Grouting ● Drilled Shafts
Water Wells ● Water Treatment
150 Denton Ave., New Hyde Park, N.Y.
431 Market St., Camden, N. J.
1250 W. Elizabeth Ave., Linden, N. J.
15 Ryder St., Arlington, Mass.
5655 Bryant St., Pittsburgh 6, Pa.

Howard, Needles, Tammen & Bergendoff
Consulting Engineers
Bridges, Structures, Foundations,
Express Highways
Administrative Services
Kansas City - Cleveland - New York

E. Lionel Pavlo
Consulting Engineer
Design, Supervision, Reports
Bridges, Highways, Expressways
Marine Structures, Public Works
Industrial Construction, Airports
642 Fifth Ave. New York 19, N. Y.

Lawrence S. Waterbury
Consulting Engineer
Bowling Green 9-9298
26 Broadway New York 4

Severud-Elstad-Krueger-Associates
Consulting Engineers
Structural Design - Supervision
Reports - Buildings - Airports
Special Structures
415 Lexington Ave., New York 17, N.Y.

Steinman, Boynton, Gronquist & London
Consulting Engineers
HIGHWAYS - BRIDGES - STRUCTURES
117 Liberty St., New York 6, N. Y.

Lockwood, Kessler & Bartlett, Inc.
Consulting Engineers

Civil Engineering Investigations and Reports, Design and Construction Supervision of Bridges, Highways, Pipelines, Expressways, Industrial Buildings, Sewerage, Airports and Municipal Improvements, General Site Engineering, Seismic Subsurface Investigation, Cadastral, Geodetic & Topographic Surveys, Photogrammetric Engineering & Mapping.

One Aerial Way, Syosset, New York
Bogota, Colombia San Juan, P. R.

Modjeski and Masters
Consulting Engineers
Bridges and other Structures
Foundations
Highway and Expressways
900 North Sixth St. Harrisburg, Pa.
Philadelphia - Miami - New Orleans

The Kuljian Corporation
Engineers • Constructors

WE DESIGN AND CONSTRUCT

Power Plants • Public Works • Processing Plants • Oil Refineries • Chemical Plants • Textile Plants • Airport Facilities • Military Installation

1200 N. Broad St., Philadelphia 21, Pa.

Michael Baker, Jr., Inc.
Consulting Engineers, Civil Engineers, Planners & Surveyors; Airports & Highway Design; Water Works & Sewerage Design & Operation; Aerial Topo Maps; Surveys; Reports & Investigations; Irrigation. Home Off.—Rochester, Pa. Br. Off.; Jackson, Miss.; Harrisburg, Pa.; College Park, Md.

Sprague & Henwood, Inc.
Drilling Services

Foundation Investigations, Soil Testing & Test Borings, Grout Hole Drilling & Pressure Grouting, Diamond Core Drilling

Main Office
221 W. Olive Street, Scranton, Pa.
Branches:
1009 Western Savings Fund Bldg., Philadelphia, Pa.
11 W. 42nd St., New York, New York
300 Mt. Lebanon Blvd., Suite 100
Pittsburgh 34, Pa.
Box 1446—Grand Junction, Colorado
Nashville, Tennessee
Buchans, Newfoundland

Professional Assistance
in solving your most difficult problems is offered by these consultants.

Buchart Engineering Corp.
Consulting Engineers
Highways — Bridges — Sewer Systems
Surveys — Water Works — Dams —
Reports — Supervision — Industrial
Municipal — City Planning — Structures
55 S. Richland Ave., York, Pa.
Lancaster, Pa. Washington, D. C.

SOUTH

Rader and Associates
Engineers - Architects

Sewage Disposal, Water Works, Ports, Airports, Bridges, Highways, Office and Commercial Buildings, Industrial Plants, Reports, Investigations, Consultations, Aerial Photography, Photogrammetry.

First Nat'l Bank Bldg., Miami 32, Fla.

MIDDLE WEST

Consoer, Townsend & Associates
Consulting Engineers

Sewage treatment, sewers, storm drainage, flood control—Water supply and treatment—Highway and bridges—Airports—Urban renewal—Electric and gas transmission lines—Rate studies, surveys and valuations—Industrial and institutional buildings.

360 East Grand Ave. Chicago 11, Ill.

Roy B. Everson
S.E. Consultant Since 1900

For Purification Systems as applied to Sewage Treatment, Water Works and Swimming Pool Circulating Systems. A New System for Automatic Control

211 W. Huron St. Chicago 10, Ill.
Phone SUperior 7-3339

Sargent & Lundy
ENGINEERS
Consultants to the Power Industry
Studies • Design • Supervision
140 South Dearborn Street,
Chicago 3, Ill.

Toledo Testing Laboratory
Engineers—Chemists
Concrete—Soils—Asphalt
Inspection Research
Tests Development
Foundation Investigation
Borings — Diamond Drilling — Load Tests
Soils Mechanics Laboratory
1810 North 12th St. Toledo 2, Ohio

AERIAL SURVEYS

Aerial Map Service Co.
Topographic, Planimetric, Photo Maps for Highways, Mining, Resources, Construction, City Maps, Tax Maps, Photo Geology, Tellurometer Radio Distance Measurements, Triangulation, Electronic Computation.

1016 Madison Ave., Pittsburgh 12, Pa.

American Air Surveys, Inc.
AERIAL TOPOGRAPHIC MAPS & AERIAL PHOTOS FOR
• Highways • Airports • Power & Pipe Lines • Railroads • Mining • All types construction • Stockpile Inventories
907 Penn Ave. Pittsburgh 22, Pa.
Branches-Manhasset, N.Y.-Atlanta, Ga.

CHECK this section whenever you need professional advice.

CONSULT THESE SPECIALISTS...

When you need professional assistance in solving difficult problems. Their specialized knowledge and broad experience can prove invaluable in saving both time and money for you.

Engineering News-Record invites other consultants to list the special services they offer on these pages. Rates for the Professional Services section are:

PER WEEK

	13 times	26 times	52 times
3/4"	$14.35	$13.35	$12.45
1½"	$23.85	$22.30	$21.00

SEARCHLIGHT
Equipment Locating Service

This service is aimed at helping you, the reader of "SEARCHLIGHT", to locate Surplus new and used Engineering and Construction equipment not currently advertised. (This service is for USER-BUYERS only). No charge or obligation.

How to use: Check the dealer ads on pages 258 & 259 to see if what you want is not currently advertised. If not, send us the specifications of the equipment wanted on the coupon below, or on your own company letterhead to:

Searchlight Equipment Locating Service
c/o ENGINEERING NEWS-RECORD
P.O. Box 12, New York 36, New York

Your requirements will be brought promptly to the attention of the equipment dealers advertising in this section. You will receive replies directly from them.

Searchlight Equipment Locating Service
c/o ENGINEERING NEWS-RECORD
P.O. Box 12, New York 36, N. Y.

Please help us locate the following equipment:..

....

Name.. Title..
Company.. Street..
City.. Zone.... State..................9/22/60

CLASSIFIED ADVERTISING INDEX

Albert Pipe Supply Co.	259
Associated Pipe & Fitting Co. Inc.	259
Baylor Construction Corp.	258
Cohen Iron Co., Leopold	259
Conmaco Inc.	259
Cooper-Watertown Corp., Abe	258
Construction Equipment Corp.	258
Dyer Co. Inc. W. H.	259
Frazier-Davis Construction Co	258
Furnival Machinery Co.	258
General Motors Corporation, Euclid Division	258
Indiana-Ohio Pipe Co.	259
Kaiser-Raymond-Macco-Puget Sound	258
Lubrecht III, Wm.	258
Memphis Equipment Co.	258
Midwest Steel Corp.	259
Mississippi Valley Eqpt. Co.	259
Monts, P. L.	257
McKee & Co., Arthur G.	256
National Blue Print Co.	258
National Schools of Construction	258
Pace-Euclid Inc.	258
Pennsylvania Dept. of Highways	257
Rocky Reach Contractors	259
Stanhope, R. C., Inc.	259
Sverdrup & Parcel Eng. Co.	257
Telephone Eng. Co.	258
Tennessee Valley Authority	257
Weiss Co., B. M.	259
Wilson Engineering Corp.	258

ADVERTISERS IN THIS ISSUE

Acker Drill Co., Inc 204
Acrow Corp. of America 240
The Adams & Westlake Co 130
Air Placement Equipment Company 220
Allied Materials Corporation 49
Allis-Chalmers 1, 248
Allison Div., General Motors Corp 16
Alhpa Portland Cement Company 246
Aluminum Company of America 102-104
American Bitumuls & Asphalt Co 150
American Bridge Div., United States Steel Corp. 111
American Manganese Steel Div., American Brake Shoe Co 192-193
American Mutual Liability Insurance Co. .. 52-53
Anchor Post Products, Inc 233
Arkwright Finishing Division 159
Armco Drainage & Metal Products, Inc. 2nd Cov.
Armstrong Cork Company 8-9
The Asphalt Institute 216-217

Barco Manufacturing Company 186
Bay City Shovels, Inc 138B
The William Bayley Company 190
Bethlehem Steel Co 140
The Bilco Co 236
Blaw-Knox Co., Blaw-Knox Equipment Div. 26
Borden Metal Products Co 54
Bower Roller Bearing Div., Federal-Mogul-Bower Bearings, Inc 197
Broderick & Bascom Rope Co .... 4th Cover

Calweld, Inc. 182
Cast Iron Pipe Research Association 124-125
Caterpillar Tractor Co 33-36
Ceco Steel Products Corp 180-181
Cement Gun Company 178
Chicago Pneumatic Tool Company 134-135
Chrysler Marine & Engine Division 76
The Clipper Mfg. Co 21
Clyde Iron Works, Inc 28
The Commercial Shearing & Stamping Co. 11
Concrete Reinforcing Steel Institute 187
The Concrete Surfacing Machinery Co 214
Contractors Register 96
Cubic Corporation 25

Decatur Engineering Co 214
John Deere Industrial Div 163-170
Diesel Energy Corp 69
R. E. Dietz Co 37
Dodge Manufacturing Corporation 177
Dorr-Oliver, Inc. 223
Joseph Dyson & Sons, Inc 172

The Eimco Corporation .... 3rd Cover
Elgood Equipment Corp 218
The Ensign-Bickford Company 242-243

A. W. Faber-Castell Pencil Co., Inc 51
Fairbanks Morse & Company 213
Fate-Root-Heath Co. 133
Flint Steel Corporation 206
Flygt Corporation 208
L. B. Foster Co 40
Fruehauf Trailer Company 107

Gahagan Dredging Corporation 105
Gardner-Denver Company 74-75
Gates & Sons, Inc 194
Geophysical Specialties Company 122-123
Granco Steel Products Co 117
C. L. Guild Construction Co., Inc 219
W. & L. E. Gurley 156

Halliburton Company 97
Hamilton Kent Mfg. Co 57
Harnischfeger Corporation 238-239
Harrison Paint & Varnish Co., Midland Industrial Division 220
B. M. Heede, Inc 210-211
Hose-McCann Telephone Co., Inc 191
The Frank G. Hough Co 93
Huber-Warco Company 6

The Ingalls Iron Works Co 195
Iowa Manufacturing Co 227-230
Ironite Company 184
Irving Subway Grating Co., Inc 200-201

The Jaeger Machine Co 189
Jersey Bolt & Spike Corporation 199
Johns-Manville Corp. 185, 12-13
Johnston Pump Co 10

Kerrigan Iron Works, Inc 173
Walter Kidde & Co., Inc 188
The Kinnear Mfg. Co 232
Koehring Division 29
Kohler Co. 91

Larsen Products Corp 215
LeRoi Div., Westinghouse Air Brake Co .. 131
Leschen Wire Rope Div., H. K. Porter Co., Inc. 14, 105, 220, 236
Lima Works, Construction Equip., Div., Baldwin-Lima-Hamilton Corp. 147
Link-Belt Speeder Corp 84-85
Lock Joint Pipe Co 38
Louisville Cement Co 81
Lukens Steel Company 17

Macomber, Inc. 119
Macwhyte Company 138A
Madsen Works, Construction Equip. Div., Baldwin-Lima-Hamilton Corp. 234
The R. C. Mahon Company 161
Maintenance, Inc. 207
Manitowoc Engineering Corp 149
Marion Power Shovel Co 155
Massey-Ferguson Industrial Division 27
W. R. Meadows, Inc 152-153
Mearl Chemical Corp 178
Merriman Bros., Inc 154
Miller Electric Mfg. Co., Inc 226
Mississippi Glass Co 209
Mobile Drilling, Inc 222
Moretrench Corporation 42
Mueller Co. 79

Naylor Pipe Company 151
Neenah Foundry Company 222
Newport News Shipbuilding & Dry Dock Co. 143
Nordberg Manufacturing Company 22-23
Northern Gravel Company 235
Norton Company 171

The Owen Bucket Co 32

Pacific Crane & Rigging Co 224
The Patent Scaffolding Co., Inc 179
Penn Metal Company, Inc 157
Phoenix Bridge Company 218
Pittsburgh Steel Products Div 112-113
Plan Hold Corp 224
Portland Cement Asociation 19
Posey Iron Works, Inc 178
The Preload Company, Inc 162

Ramset Fastening System 18
Raymond International, Inc 202-203
Reda Pump Company 218
Remington Arms Company, Inc 106
Republic Steel Corporation 144-145
Rex-Spanall, Inc. 4-5
Richmond Screw Anchor Co., Inc 2
Rilco Laminated Products, Inc 142
H. H. Robertson Company 7
Rockwell-Standard Corp., Universal Joint Div. 15
John A. Roebling's Sons Division, The Colorado Fuel and Iron Corporation 129
Rolatape, Inc. 214
The Ruberoid Co 94

Sauerman Bros., Inc 101
Saxe Welded Connection 110
Schramm, Inc. 196
Seismograph Service Corp., Seiscor Div 162
Shlagro Steel Products Corp 98
Sonoco Products Company 30-31
Special Construction Machines, Ltd 205
Spencer Chemical Co 99
Spencer, White & Prentis, Inc 127
Sprague & Henwood, Inc 212
Stacor Equipment Co 236
Standard Dry Wall Products, Inc 148
John W. Stang Corp 3
Stanpat Co. 191
Stow Manufacturing Co 225
Superior Concrete Accessories, Inc 199
Sylgab Steel & Wire Corp 108

The Tapecoat Company 204
Thew Shovel Co 24
Thiokol Chemical Corp 244
Thor Power Tool Co 86
Twin Disc Clutch Co 109

The Union Metal Mfg. Co 121
Unit Crane and Shovel Corp 114
United Steel Fabricators, Inc 176
Universal Form Clamp Co 20

Vitro Engineering Company 83

Waco Manufacturing Company 233
Waljohn Waterstop, Inc 141
Warren-Knight Co. 240
Watco Div. of Plant City Steel Corp 240
Water Seals, Inc 132
Waukesha Motor Co 120
The Weinman Pump Mfg. Co 160
West Chemical Products Inc 205
Williams Equip. & Supply Co 201
Winpower Mfg. Co 201
Wisconsin Motor Corporation 237

Yeomans Brothers Co 221

Professional Services 260

CLASSIFIED ADVERTISING

F. J. Eberle, Business Mgr.

Employment Opportunities 255-257
Notices
  Proposals 253-255
Equipment
  (Used or Surplus)
  (For Rent, Sales Wanted) 258, 259
Advertisers' Index 260

ENGINEERING
NEWS-RECORD

330 West 42 St., New York 36—LOngacre 4-3000

ABP Member ABC

Number of copies of this issue printed 86,612

D. S. ROBERTSON, Advertising Sales Manager
HUGH J. CARLSON, Assistant Business Manager

ADVERTISING REPRESENTATIVES
Atlanta, 3—1301 Rhodes-Haverty Bldg.
Robert H. Powell, Jr.
Chicago, 11—520 No. Michigan Ave.
L. H. Hunt, W. G. Payne, Earl S. Moore, Jr.
Cleveland, 13—1164 Illuminating Bldg.,
55 Public Square
H. A. Bergstrom, F. P. DiToro
Dallas, 1—Vaughn Bldg., 1712 Commerce St.,
John Grant, Robert T. Wood
Denver, 2—Tower Building, 1700 Broadway
J. W. Patten
Detroit, 28—Penobscot Bldg.,
R. I. Mace
Los Angeles, 17—1125 W. Sixth St.,
Knox Bourne, S. S. Tiebout
New York, 36—500 5th Ave.
C. D. Neulen, H. T. Olsen
Robert L. Barker
Philadelphia, 3—Six Penn Center Plaza
D. G. Jensen
Patrick Keleher
Pittsburgh, 22—4 Gateway Center
Malcolm Russell
St. Louis, 8—Continental Bldg.,
E. B. Mingle, Jr.
San Francisco, 4—68 Post St.
John J. Hernan
OTHER SALES OFFICES:
Boston 16—350 Park Square Bldg.,
United Kingdom, Edwin E. Murphy, 95 Farringdon St., London E.C. 4.—Germany, Austria, Stan Kimes, 85 Westendstrasse, Frankfort/Main, Germany—Switzerland, Italy, France and Belgium, Michael R. Zeynel, 2 Place du Port, Geneva, Switzerland

Editorials

The Great Indus Decision

SETTLEMENT of the question of the division of Indus Basin water between India and Pakistan is an event of world-wide importance.

- It literally averts a war, which threatened over India's plans to divert water that several million Pakistanis need to exist.
- It affords a firm foundation for healthy growth in two of the world's most important new nations.
- It clears the way for an engineering and construction job of record-breaking magnitude in the field of water resource development.
- It marks a notable beginning of cooperative international participation in foreign aid—five countries joining the U.S. in making grants.
- And it again affirms the position of the World Bank as a major and unique diplomatic force in solving world controversies by economic common sense—and in this case by uncommonly patient and astute engineering statesmanship.

Everything about the Indus settlement can only be described by figures of great magnitude. The river, with its tributaries, has a mean annual flow of 168 million acre-ft—ten times as much as the Colorado and as much as the Columbia. Some 47 million people depend upon its waters directly and indirectly. It irrigates nearly 30 million acres, more than the total acreage under irrigation in the whole U.S. And more than 65 million acre-ft of its flow goes to sea unused.

It is this latter figure and the fact that this excess water, most of which is in Pakistan, is not readily available to replace water which India can divert, that fashioned the type of engineering solution now agreed on. The excess water will be impounded in two large reservoirs in Pakistan, and it will then be released into a series of large canals linking the tributaries to the east, which need it. With this mammoth water transfer completed, India can divert the water that originates in these tributaries for her own use and without harm to Pakistan.

The engineering and construction tasks attendant to this tapping and taming of the great Indus River will marshal technical talent from all over the world. Already at work for Pakistan, which wisely carried on its planning while negotiations dragged through more than a decade, are consultants from Great Britain and such well known U.S. firms as Harza Engineering Co. of Chicago, Tipton and Kalmbach of Denver, and Tippetts-Abbett-McCarthy-Stratton of New York City. The roster will no doubt be swelled by other names, for the work even now laid out will take at least 10 years—and there are other dams to follow.

At the moment, however, it is not the details of carrying out the job that command greatest attention and admiration, but the fact that a treaty has been signed and that the World Bank was the catalyst that created this happy result. The Bank, of course, has acted in similar capacity before. It tried—and failed—to settle the Iran oil crisis. But it then successfully played a decisive role in getting agreement between Egypt and the Suez Canal Co. stockholders and between Great Britain and the United Arab Republic, which together liquidated the Suez crisis. It failed to win for the West the job of building the Aswan Dam after the U.S. withdrew its support. But now with the conclusion of the Indus agreement it has scored its most spectacular diplomatic triumph.

This is believed to be the first time that a major river dispute has been mediated successfully by an international organization. General acceptance of the World Bank in this rolé may well afford an answer to the solution of other troublesome problems throughout the world. And since most of these problems involve engineering and construction in one way or another, the World Bank is a force to be reckoned with and welcomed.

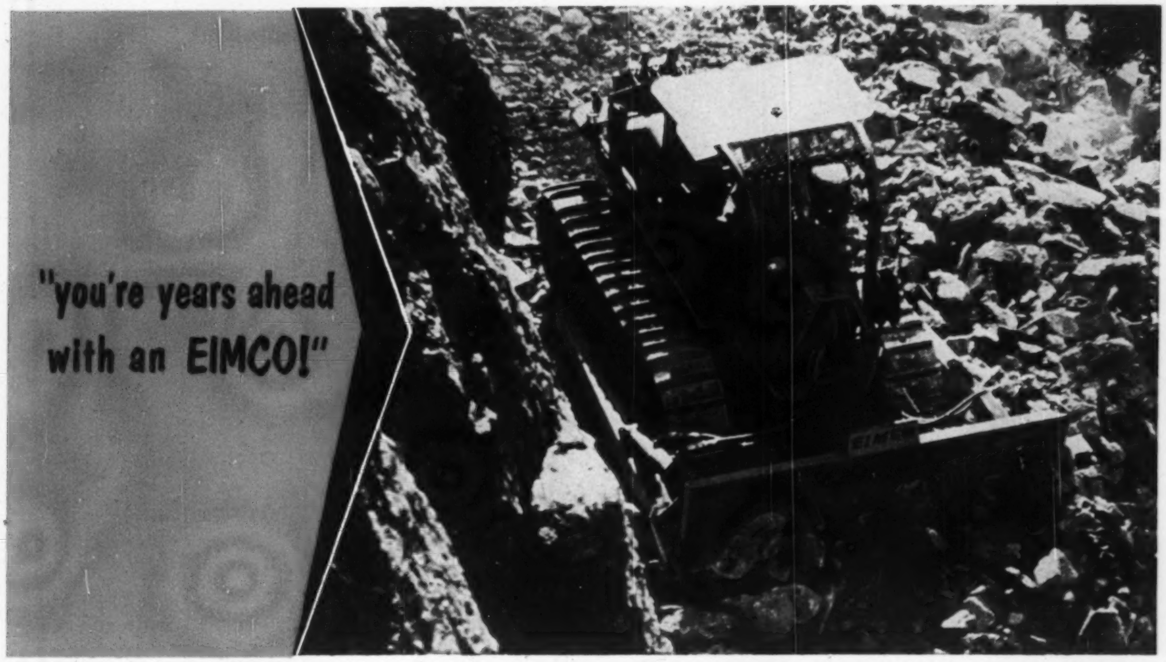
Air Conditioned Schools

THE PAST SUMMER, like all summers before it, has seen most of the nation's school plant lying idle. At the same time, city after city, state legislatures and the federal government have continued to wrestle with the problem of financing more new school construction to meet the twin demands of increasing student population and lengthening education programs.

The uneconomic consequences of this paradox could be avoided by lengthening school terms into or through the summer. And summer school sessions could be made more acceptable and more efficient if schools were air conditioned.

Whether or not to add air conditioning is, of course, an economic question that must be answered for each individual school. For the most part, however, designers, educators and school board members have been more inclined to avoid the question than to examine it. But with the need for utilizing our school plant to the utmost, and a growing desire on the part of students to go to school the year round and thus reduce the lengthy educational process, air conditioning would seem to be one of the utilities that should be more frequently considered.

The best time for such consideration is when new schools are being planned but existing schools can, of course, be air conditioned, too, when that is necessary. In any event, a nine-month school year is not apt to be tenable much longer. Designers, therefore, must consider all possible means to make the nation's school plant efficient during the summer months. In many cases air conditioning may well be found to offer advantages that cannot be ignored.



EIMCO WINS RACE TO BEAT THE WINTER STORMS!

The job? A Government agency had to construct a road for transportation of supplies to a field station in the Central Sierra Nevadas in California. Due to the steepness of the mountain, the road had to be kept at a grade of about 25%. Through the pioneering stages of the road, grades ran as high as 40%. The entire job had to be completed before the onset of the terrible winter storms that hit this area, for if equipment was not through and moved out by the early snows, it was even money that it could not be moved at all until the following spring or summer. The road is at an altitude of 8,600 feet!

The machine? The great Eimco 105-T Bulldozer was used to pry out large rocks, pioneer, build and grade. The rocky condition was not solid enough to require blasting, but tough enough that large teeth were necessary on the blade to rip into the seamy rock. Originally, it was believed that a bigger machine was necessary, but the powerful, maneuverable Eimco 105-T, which fully utilizes its 156 H.P. (sea level) turbo-charged engine through Eimco's exclusive "Unidrive" Transmission and Dual Final Drives, soon won the fullest respect and praise from its owners and operators . . . and the race against the storms.

The conclusion? The tougher the job . . . the tighter the schedule . . . the more you'll appreciate the advanced engineering and quality craftsmanship of the **modern** crawler-tractor . . . the Eimco tractor . . . available in three great series. Write for particulars to The Eimco Corporation, P.O. Box 300, Salt Lake City 10, Utah, U.S.A., or contact your nearby Eimco dealer or branch office.

Eimco . . . the World's Greatest . . . and first modern . . . Tractor!

"ADVANCED ENGINEERING AND QUALITY CRAFTSMANSHIP SINCE 1884"

THE EIMCO CORPORATION

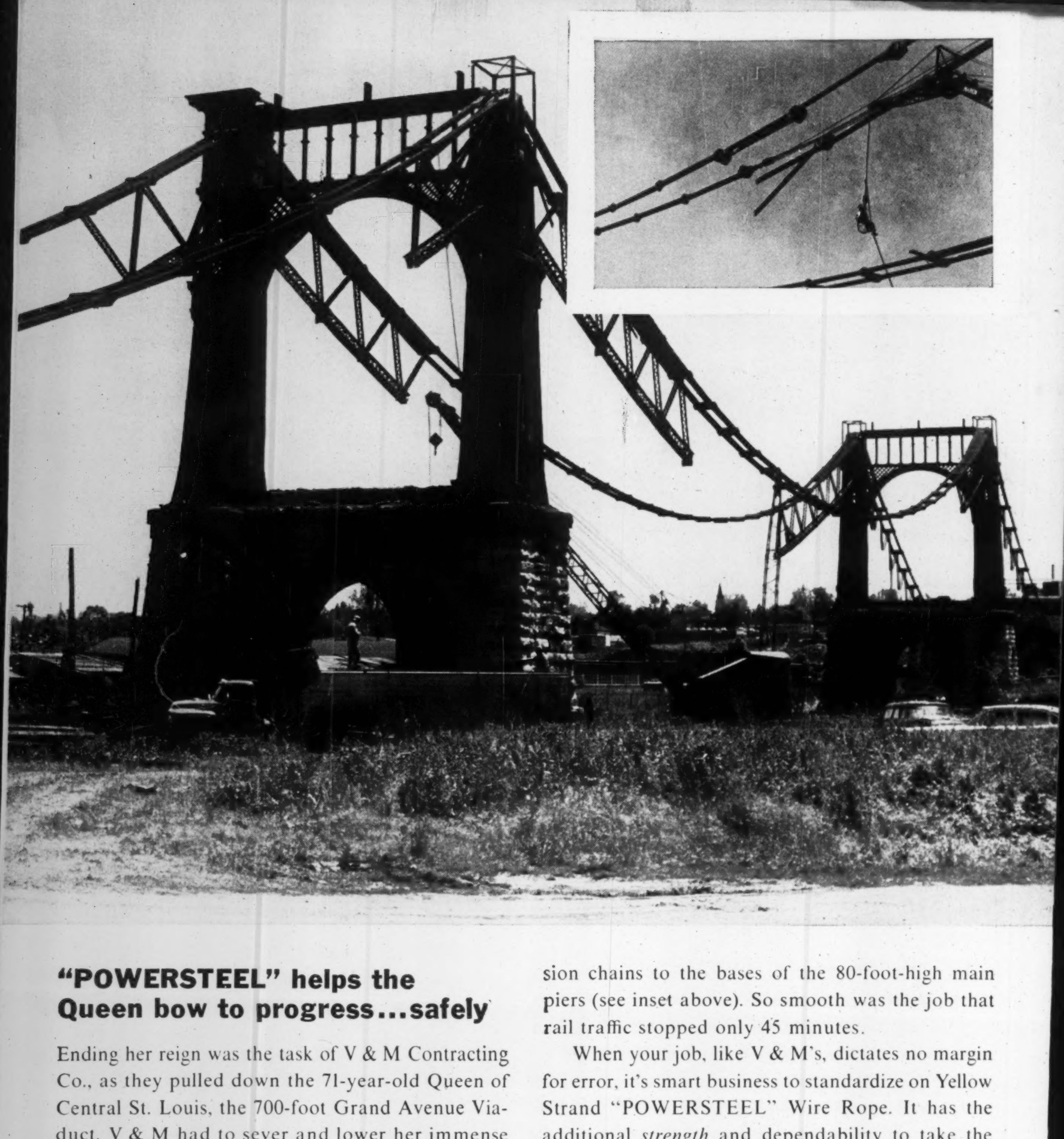
EIMCO

TRACTOR LOADER DIVISION

634 SOUTH 4TH WEST
SALT LAKE CITY, UTAH — U.S.A.

EXPORT OFFICE: 51 - 52 SOUTH STREET, NEW YORK, N. Y.
BRANCHES AND DEALERS IN PRINCIPAL CITIES THROUGHOUT THE WORLD

B-543



"POWERSTEEL" helps the Queen bow to progress...safely

Ending her reign was the task of V & M Contracting Co., as they pulled down the 71-year-old Queen of Central St. Louis, the 700-foot Grand Avenue Viaduct. V & M had to sever and lower her immense suspension chains to the ground . . . in the middle of the busiest railroad yard in the city. Made up of multiple eyebar links, each 13 feet long, the chains could have done considerable damage had they slipped. Careful planning and the right equipment paid off—a Yellow Strand "POWERSTEEL"-equipped winch carried the weight as the chains were cut at the center, then safely lowered the two segments of suspension chains to the bases of the 80-foot-high main piers (see inset above). So smooth was the job that rail traffic stopped only 45 minutes.

When your job, like V & M's, dictates no margin for error, it's smart business to standardize on Yellow Strand "POWERSTEEL" Wire Rope. It has the additional *strength* and dependability to take the toughest jobs in stride with safety. Call your Yellow Strand Distributor for complete "POWERSTEEL" information. *Broderick & Bascom Rope Co., 4203 Union Boulevard, St. Louis 15, Missouri.*

Yellow Strand®
"POWERSTEEL"®
WIRE ROPE